

The Mining Journal

RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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LONDON, SATURDAY, JANUARY 11, 1879.

WITH SUPPLEMENT. PRICE SIXPENCE. PER ANNUM, BY POST, 41 6d.

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25 Devonport and Tiver- 50 Monydd Gorrdu, 20 W. Chiverton, 12s. 6d.
ton Brewery, 40 Morfa Du, 17s. 20 Van, 217½.
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40 Don Pedro, 20s. 3d. 20 Llanrwst, 50 Rossa Grande, 1s. 6d.
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CLAUSTHAL MINING SCHOOL NOTES.*—No. CIII.

BY J. CLARK JEFFERSON, A.R.S.M., W.R.S.C.,

Mining Engineer, Wakefield.

(Formerly Student at the Royal Bergakademie, Clausthal).

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SECTION V.

A comparison of the figures given in the table, and those from actual practice, show a great disparity, which is greatest in the case of the shallower depths. This is due to the fact that although a thickness of 1-10th inch may be sufficient to resist a head of water of 60 ft., still it is insufficient to allow of a margin for any unsound part of a casting, or to allow for other accidental causes of breakage. Besides, the upper part of the shaft lining has often to carry some considerable weight in the shape of pumping arrangements, &c., and therefore, on this account alone, a greater strength may be required than is necessary for resisting the head of water. Again, iron lining is attacked more or less by saline waters, and, if very thin, would soon be so far eaten through as to be unable to support the pressure of water behind it. For these reasons it is usual to make the upper part of the lining much stronger than is theoretically requisite. When sinking the St. Vaast Pits by Kind Chaudron's method,† the strength of the cast-iron lining which it was intended to make of full cylinders 5 ft. high and 11.5 ft. in diameter, was calculated according to the following rule:—"The thickness of the lining in metres is given by multiplying the radius, in metres, by the pressure, in kilogrammes, per square centimetre, and dividing the product by 500, and adding 2 centimetres to the quotient as a constant." Since the weight of 1 cubic metre of water is 1000 kilogrammes, the above rule may be altered, to give the pressure in terms of depth of the shaft. It then becomes—"The thickness in the lining (in metres) is given by multiplying the radius (in metres) by the depth of the shaft (in metres), and dividing the product by 5000, and adding 2 centimetres to the quotient as a constant." This rule gives the thickness of the lining for the following diameters and depths as under:—

Depth 20 metres	DIAMETER OF SHAFT.			
	3.0 metres.	3.5 metres.	4.0 metres.	4.5 metres.
" 40 "	.026	.027	.028	.029
" 80 "	.032	.034	.036	.038
" 120 "	.044	.048	.052	.056

This rule, as is evident, gives too great a result for the greater depths, and was practically used only for a depth of at most of 60 metres.

Lottner gives the following rule for finding the thickness of the lining of metal tubings, in which he assumes the reliable resistance of cast-iron to crushing at 512 kilogrammes per square centimetre:—"The thickness of the lining in centimetres is obtained by multiplying the radius (in metres) by the depth (in metres), and dividing the product by 51.2, and adding .333 to the quotient as a constant. According to this rule the annexed table gives the thickness for the following diameters and depths:—

Depth 20 metres	DIAMETER OF SHAFT.			
	3.0 metres.	3.5 metres.	4.0 metres.	4.5 metres.
" 40 "	.019	.016	.014	.012
" 80 "	.1505	.1699	.1895	.2089
" 120 "	.2677	.3069	.3457	.3845

Greenwell gives the following rule:—"The thickness of the lining in feet is obtained by multiplying the diameter (in feet) by the depth (in feet), and dividing the product by 50,000, and adding .03 to the quotient as a constant.

From the above rule Greenwell gives the following table of the thickness of the lining for the following depth for shafts of the undermentioned diameter:—

Depth of shaft.	DIAMETER OF SHAFT.			
	10 ft.	12 ft.	14 ft.	15 ft.
60 ft. ....	.504	.518	.532	.547
20 fms. ....	.048	.076	.105	.134
30 fms. ....	.072	.085	.098	.111
40 fms. ....	.096	.103	.110	.117
50 fms.	1.080	1.152	1.224	1.296
60 fms.	1.224	1.310	1.396	1.483

As Lottner remarks, the above rule given by Greenwell is simply empirical, and gives, when compared with the example of the Hibernia Colliery, too great a thickness.

Atkinson gives the following rule:—"The thickness in inches is obtained by multiplying six times the diameter (in feet) by the pressure in lbs. per square inch, and dividing the product by the difference between the resistance of cast-iron to crushing in lbs. per square inch, and the pressure per square inch on the lining. In making use of this rule Atkinson assumes 6 as the factor of safety, and hence the reliable resistance of the metal to crushing as 15,000 lbs. per square inch. This rule gives the following as the thickness of the lining for the annexed depths and diameters.

Depth 60 feet.....in.	DIAMETER OF SHAFT.			
	10 ft.	12 ft.	14 ft.	15 ft.
" 120 "	.104	.114	.124	.1352
" 240 "	.29	.319	.348	.377
" 360 "	.42	.462	.504	.546

This rule of Atkinson's is approximately the same as that given in the last lecture, as deduced from a purely theoretical consideration; and the results in the above table agree practically with those given in the last lecture as deduced from the theoretical formula when assuming 6 as a factor of safety, and 100,000 lb. as the resistance of good cast-iron to crushing.

The following is another rule sometimes given for obtaining the thickness of the metal for tubings:—"The thickness in inches is found by multiplying the radius in feet by the depth in feet, and the product by 0.000735, to which .125 is added as constant. Lastly, Combes gives the following rule for finding the thickness of the lining:—"The thickness of the metal (in metres) is obtained by multiplying the depth (in metres) by the radius (in metres), and dividing the product by 6000."

A comparison of the above rules will show a considerable disparity in the results; and since none of them take into account the height of the segments, and the additional strength due to the flanges and ribs, it will not be surprising to find that they are not adhered to in practice. This disparity is due partly to the reasons given at the commencement of this lecture, and partly to the fact that the pressure exerted on the back of the lining is not always equal to that of a column of water of the same height as the depth of the shaft; and even where the level of the surface of the water can be accurately ascertained the resistance encountered by the water in percolating the strata diminishes very considerably the pressure which would be due to the actual head of water. Each case is, therefore, generally treated as local circumstances indicate, and it is advisable to take into account the extra strength given by the flanges and ribs. The calculations referring to the flanges will be made in an analogous manner to those of the strengthening hoops or rings of boiler flues. Generally it may be said that the thickness should in no case be less than $\frac{1}{4}$ in.

The height of the tubings varies between 1 ft. and 2 ft., being less the greater the depth or pressure. The length of the segments varies between 3 ft. 6 in. and 4 ft. 6 in., and the flanges project from 3 in. to 4 in. In addition these flanges are provided on two adjoining sides of the segments with short flanges, about $\frac{1}{4}$ in. broad, and which project about $\frac{1}{4}$ in. behind the exterior edges of the flanges. The short flanges cover the horizontal and vertical joints between the segments, and are intended to prevent the sheathing inserted in the joints from being driven out during the wedging. These addi-

tional flanges, though extremely advantageous, are not always cast on the segments. After the wedging cribs have been properly fixed and wedged the upper surface is covered by thin pieces of Memel pine, with the fibres placed radially. The segments are laid upon each other, so as to break joint (the vertical joint between two segments is situated in a line with the centre of the next over or underlying segment. All the vertical, as well as the horizontal, joints are made water-tight by inserting thin pieces of Memel pine, as in the case of the wedging crib. It is but seldom that the segments are held together by means of bolts passing through the flanges. In order to preserve the segments in a perfectly vertical position, and at a uniform distance from the centre of the shaft, blocks of wood and wedges are driven between the segments and the sides of the rock, by which means the position of each segment can be correctly adjusted. The remainder of the space is filled with soil or concrete. Sometimes the flanges of the segments are turned, and the joint is made tight by well tallowed hemp on strips of lead. It is customary to close the outlet holes in the segments of the wedging crib, and in the first two or three rows of segments next to the wedging crib, almost immediately after they have been placed in position, as this induces the ground or soil behind the wedging crib to settle down more compact. Workmen accustomed to metal tubing can place from 2 to 3 yards of tubing in position per hour, but this is exclusive of the wedging of the joints.

When the metal tubing has been thus carried up to form a junction with the lining above, or the surface, the holes in the segments are closed, beginning at the bottom; but no hole is closed until the water has begun to flow out of the holes in the next upper ring of the tubing, so as to make sure that no air is imprisoned behind any of the segments. Where a shaft is lined with several lengths of tubing it is not usual to place the space behind these lengths in communication, but a separate pipe from the upper part of each set gives opportunity for the compressed air behind the lining to escape. The necessity for this precaution is not very clear. The conical stoppers, which are driven into the outlet holes in the segments, are wedged tight by means of two wedges driven in at right angles to each other.

The wedging of the joints commences at the bottom, and proceeds upwards, the horizontal joints being wedged before the vertical joints. The wedges used are about 4 in. long by $\frac{1}{4}$ in. broad, by $\frac{1}{4}$ in. thick, being made of pine having very fine fibres. The wedging is repeated where necessary, sometimes proceeding in this case downwards. Where necessary a special set of segments must be cast, to form the junction with the foot of the superposed length of lining of a height sufficient to fill the space, should it vary much from the height of the segments. There is no difficulty in making the junction water-tight by wedging the horizontal joints.

The work of placing the segments in position and of wedging is effected with the help of a flying scaffold or cradle, in a similar manner to that described in the last lecture for lining shafts with brickwork.

The timbering in the shaft is sometimes fixed in position by nailing it to the wood between the joints, or in the case where a great weight has to be carried, as pumps, &c., by means of cross bearers let into holes cast purposely in some of the segments. In the latter case it is usual to have two cross bearers, situated at about 3 yards to 4 yards apart, the upper one being supported in the centre by means of two inclined struts, footed into the lower bearer close to each end. One of the holes in which the ends of the cross bearer are inserted is made twice as deep as the other, to enable the bearers to be introduced. The bearers are fixed tight by wedging. Where the bearers have a considerable weight to carry the segments containing the holes cast to receive the ends of the bearers rest upon one or two wedging cribs, which have been purposely inserted during the lining. In the case of wooden conductors the latter can be attached either directly to the wood inserted in the joints, or to cross bearers attached to the sides of the shaft in the same manner. On the Continent, where a single shaft is sometimes divided into several compartments, the timbering to divide the shaft will be most readily fixed by nailing it to the wood between the joints. At the Rhine-Elba Colliery the partition is formed by nailing two stringing pieces, each about 10 in. broad by 3 in. thick, to the wood inserted in the joints, and cutting 8-in. square holes in the centre, so that a piece 4 in. broad and 8 in. long is taken out of each stringing piece. In these holes the ends of the cross bearers are inserted.

MINING INSTITUTE OF CORNWALL.

Many valuable suggestions not connected with the immediate business of the society were made at the recent meeting of the Mining Institute of Cornwall, which appears to be thoroughly well fulfilling the purpose for which it was established. In connection with the change of presidents—Mr. Basset's term of office having expired—it was truly remarked that Capt. Teague, the new president, has done as much for mining in his way as Mr. Basset has done in his, and that the Institute begins the present year with great prospects of success. Capt. Teague observed that he did not at all agree with those who were inclined to underestimate the value of such an institution, and who doubted its necessity. When the subject first came under consideration he certainly thought there was need for something in the shape of an institution which should partake of the character of a self-protecting organisation, so that a communication might be opened up between the miners of the county for an interchange of thought and opinion. It had long been said—and he was afraid there was a good deal of truth in the observation—that the miners of the county of Cornwall were as a rope of sand, and that they never could hold together. But he hoped the time for that had gone, and that in future they would be able to show to the world that they were of a far less shifty or gritty material than the rope of sand, and that when occasion demanded it they could be a thoroughly united and harmonious body. He hoped that the Mining Institute, which had been started under such encouraging auspices, would continue its usefulness for many years to come, and that it would soon be in a far more healthy and flourishing state than it was at present. Even now, considering the depressed times, and the difficulties with which they had to contend, he did not think they had much cause to complain of the position which the Institute was in. There could be no question as to the practical value of the various meetings which had been held, and financially, although they might like to be better, yet certainly they could be very much worse. The long-continued depression had taught them the very useful lesson of economy, and that had enabled them of late years to work their mines so much more cheaply than formerly, and he hoped that when better times came they would, above all things, be careful not to forget the lesson which they had thus been taught. Economy, if it was wisely directed, should be exercised as well in times of prosperity as in times of adversity; but he was afraid that they were too often tempted to forget this, and to be rather more prodigal than they need be, when the means to do so were at hand. But having been taught the real principles of economy by a sad experience, he was sanguine that they would profit by it in the future.

With regard to the future, Capt. Josiah Thomas, of Dolcoath, said that it was a cheering fact, and one at which they might all rejoice, that the demand for tin had at last overtaken the supply, and he believed that at present it somewhat exceeded it. If this should continue it was easy to see that the price of tin must again advance. He believed most mining gentlemen would agree with him that the great depression through which they had passed had not been altogether an unmitigated evil. Those who were connected with mines and had had the responsibility of working them had been obliged to put forth their most earnest efforts in order to work as economically as possible, and to introduce the most improved machinery practicable for the purposes of economy, and this had been done with great success. He believed the most important improvement which had taken place in mining for many years was the introduction of boring machines. They had thus been enabled to drive considerably faster than by hand labour, and in many instances at much less cost. Although it was not so very long ago that they were first introduced, he was glad to find that there were already six different machines working in various parts of the

county, and they would now soon be in a position to ascertain which was the best suited for their hard Cornish rocks; which, in fact had the greatest powers of endurance, and which had the most important features connected with them. Undoubtedly one great advantage derived from them was that of working by compressed air. Again, during the last few years more powerful explosives had been introduced into Cornish mines; in some cases they had been exceedingly valuable, whilst in very hard or wet ground he believed that they were simply invaluable. But in dry ground, or in ground of moderate hardness, he thought it was exceedingly doubtful whether these powerful explosives were really worth five or six times as much as powder.

The question of the exhaustion of Cornish mines was judiciously referred to by Captain Teague, junior, who remarked that it had been suggested that their mines were becoming exhausted, but that was altogether out of the question. The deeper the mines got the better they became. They had a splendid evidence of this in Dolcoath, where the bottom was equal both in quantity and quality to anything that had ever been met with before, and this showed there was a possibility of working their mines with rapidity without injuring their future prospects. The fact was that their mines were not worked with any idea of permanency. At present probably they were driven by circumstances to do things which they would not do in more prosperous times, but there were many things which had been neglected in the past that they could now very well take up and deal with. One very great advantage which they had in connection with boring machinery was that they could set a contract for twelve months, and the contractors were bound to go on. The advantage derived from this was that they could get through a poor bar of ground into another, but when hand-labour was employed the progress made was so slow that when they got into a poor piece of ground, and found that it did not pay, the mine was abandoned before its development could be carried any further. He contended strongly that, worked on right principles, mining was a permanency, that there was no uncertainty whatever about it, and that there was nothing under the sun more remunerative than Cornish mining. He had no fear of the foreign competitor, and believed the mining men of Cornwall did not know what they could do until they were put to it. He was in no great degree depressed by the hard times through which they had already passed, because he was convinced that to a very great extent the future was in their own hands.

The various rock boring machines at present in use in Cornwall were favourably referred to by Dr. Le Neve Foster, who reminded them that they were assembled in a town wherein lived Trevithick, who was, he believed, the inventor of boring machinery; it was in that neighbourhood, too, that rock-drills were first successfully introduced. In this respect at any rate, if in no other, they could view with satisfaction the year which had just drawn to a close, as hailing the introduction of several new boring machines. This time last year they had the Barrow at Dolcoath, the Beaumont at Carn Brea, and the McKean at South Roskear; but now, in addition to these, they had the Ingersoll at Drakewalls, the Champion at New Cook's Kitchen, and the Eclipse at West Basset. These drills had most important advantages to all persons connected with mining; not only to the adventurer by enabling him to drive through ground with greater speed and economy, but to the working miner as well, because the mines were well ventilated, and the men were relieved from a very fatiguing work. In addition to this there was the other advantage mentioned by Capt. Teague, jun.—that of setting contracts for a long period, and getting through poor bars of ground and into others without the disagreeable necessity of having to suspend operations. He, therefore, thought they would all admit that the introduction of boring machinery into the country marked an era in the history of Cornish mining.

It is usually acknowledged that those who are strongest can afford to be most generous, and if this be so the proprietors of the Eclipse drill may well be congratulated, for Capt. Henderson remarked that the more he saw of the advantages of those machines the more he was convinced the Chairman was right in what he said. As the representative of the Eclipse drill he did not want on that occasion to sing its praises. He thoroughly despised the men who sought to raise the merits of their own pet machine by crying down others. In making this remark he referred more particularly to those unpleasant letters which had been appearing from time to time under the signature of "H. W."—a gentleman who attempted always to cry down the Eclipse drill. This drill was as yet a novelty, and no one had a right to condemn a thing before its merits or demerits had been proved. As a matter of fact the machine had now been working for about two months at West Basset, and when he told them that in the Christmas month—which they all knew to be a broken month—it had driven a distance of 104 fathoms with one single 24-in. drill he thought they would admit it spoke very highly for what was called the "toy drill." No doubt there were others that did equally well, and he really believed the Champion drill was a splendid machine. That was how different competitors ought to speak of each others drills, and so far as he was concerned it was a great pleasure to him to be able to bear his testimony to the merits of other inventions. He believed there was work for hundreds of drills in the county. The merits of the Eclipse drill would shortly be known, and then he hoped they would be able to come into the market and take contracts in many of the mines. He had such confidence in it that he had purchased one of the drills, and had himself taken the contract at West Basset, altogether independent of the firm. His object was to put forward the drill in which he had confidence, and he believed that was a perfectly legitimate way of going to work. He believed he was right in saying he was the first to start a drill in the county at hand-labour prices, guaranteeing double speed at the same time. He had been told he should lose largely by it, but he could assure them it was not so. He was perfectly satisfied with what he was doing, and he hoped to continue to the end of the contract.

CENTRAL AFRICA.—A meeting of gentlemen largely concerned in the trade of Lancashire was held, on Tuesday, at Manchester, for the purpose of considering the practicability of opening up Central Africa as a market for English goods by the construction of a railway from the eastern coast of the continent to Lake Victoria Nyanza, with a view to bring the produce of the interior down to one of the ports of Zanzibar. A committee was formed to receive subscriptions in order to diffuse information on the subject.

THE ELECTRIC LIGHT IN THE FACTORY.—An interesting experiment has been made in the introduction of the electric light into the factory of Messrs. Wills, of Bristol. The machine used was the American Wallace-Farmer machine, being the same as that used by the American inventor—Edison—the armature of which consists of a number of bobbins arranged round the periphery of the wheel. These rotate at the speed of about 500 revolutions per minute between the poles of a powerful electro-magnet, which is joined upon the same circuit. This generates the current of electricity, which is carried round the extensive factory by cables that traverse the several rooms, so that by severing the cables in any room and attaching the two ends to a Wallace lamp as many as ten electric lights can be obtained in as many departments of the establishment. The machinery was fitted up under the supervision of Dr. Thompson, of the Bristol University College.

THE ELECTRIC LIGHT.—The Lighting Committee of the Paris Municipality have reported in favour of a 12 month's experiment. The Avenue de l'Opéra, the Place de la Bastille, and one of the market buildings are to be lit by the electric light at a charge not exceeding 30 c. per hour for each burner, while the gas company is to light the Rue du Quatre Septembre, the Place du Château d'Eau, and another market building in an improved fashion at an extra charge of not more than 5 c. per cubic metre. The company will place four or eight burners on the present lamps covered with large shades, thus consuming about seven times as much gas. The electric company hopes to be able to reduce the motive power from 1.25-horse power per burner to .33, which would bring down the cost from 73 c. to 60 c.

* Being Notes on a Course of Lectures on Mining, delivered by Herr Berggrath Dr. von Gumboldt, Director of the Royal Bergakademie, Clausthal, The Harz, North Germany.

† To be shortly described.

ABRIDGED PROSPECTUS.

The Rhine and Moselle Mining Co.,

(LIMITED).

Under the Companies Acts, 1862 and 1867, with Limited Liability.

CAPITAL £30,000, IN 30,000 SHARES OF £1 EACH.

ISSUE OF 25,000 SHARES, OF WHICH SUBSCRIPTIONS ARE INVITED FOR 14,500.

PAYABLE—5s. per share on application, 5s. on allotment, 5s. in two months after allotment, and 5s. in six months after allotment.

DIRECTORS.

GEORGE GOWLAND, Esq., The Downs, Clapton.
C. S. HILL, Esq., Beckenham.
SAMUEL MART, Esq., Three Crown-square, Southwark.
E. V. NEALE, Esq., Church-row, Hampstead.
W. C. PARKINSON, Esq., Cottage-lane, City-road.
SECRETARY (pro tem.)—Mr. A. H. CARLEY.

OFFICES.—4, NEW BROAD STREET, LONDON, E.C.

This company is formed to purchase and work the mining concessions of Aurora, New Weisweiler, and Marienberg, of which the first is adjacent to the well-known and rich mines of the Bensberg and Seigen districts, near Cologne; and the latter two are in the strike of the great and productive lodes which cross the Rhine and Moselle from Nassau to the Eifel—the New Weisweiler being near the village of Tries, and the Marienberg at Ravensbeuren near Enkirch, both on the Moselle.

I.—The Aurora consists of numerous Government concessions, now forming one consolidated grant in perpetuity of 5140 acres, or about 8 square miles, a mining field of unusual magnitude, subject to a royalty of 1-50th only. Eight known parallel lodes traverse the sett, three having been laid open at shallow levels only, from which a very large quantity of lead ore has been raised and sold.

It will be seen by reference to the reports that the indications of further discoveries of ore, equal to those which have already yielded so largely, are numerous—without reckoning the more distant, and, according to analogy, more prominent points, both in depth and longitudinally, at the junction of the lodes.

The local manager, Mr. Otto, says, in his report on the Aurora Mine:—"Although the work of laying open the mine cannot be said to have been largely done there exists, nevertheless, reserve stopping ground to the extent of 3000 to 3300 square fathoms ready for removal, representing 2750 tons of ore in sight."

This quantity remains after the removal and sale of 4482 tons of lead from the adit and 16 fm. levels only, but chiefly from the adit, an unusually large quantity having regard to the shallowness of the workings. He adds "that the adjacent Silberkaule Mine has of late so increased its returns that it at present produces monthly 180 tons of lead ore, and the Mine Castor, to the north of Aurora, produces monthly 225 tons of lead ore."

Mr. Naueser, the manager of extensive mines at Bensberg, says:—"In regard to the lodes (of Aurora) in depth it may be stated that in many mines of the neighbourhood depths from 110 to 160 fathoms have been obtained and witnessed to a regular continuance of the ore deposits going down, although interchanging now and then with barren portions. My opinion is, therefore, that lodes like No. 4 and No. 7, which have shown such rich courses of ore are not likely to have reached their limits of productiveness, neither in their horizontal or vertical continuation; but, on the contrary, that further discoveries may, with a considerable degree of certainty, be expected."

Capt. Toy, of Llanidloes, who has inspected this mine, says:—"Looking at the very extensive sett, containing eight well-known lodes, the shallowness of the mine, with little water to pump, congenial strata, and large reserves, the prospects are more than ordinarily good, whilst its facilities for rapid and economical development make it one of the most promising and desirable fields for mining enterprise that I know of."

II.—The New Weisweiler comprises a concession in perpetuity at a like royalty of over 1100 acres, or nearly two square miles, the explorations in which are confined to the discovery of a splendid lode, carrying a solid leader of lead and blende, and presenting great facilities for working it speedily and economically.

In reference to this discovery, Capt. Toy says:—"I have been a miner 50 years, and in different parts of the world, but in all my travels I never before saw such a fine-looking lode so near the surface, and I consider the prospects to be exceedingly good. It is eminently entitled to a vigorous and sustained prosecution, which, if properly carried out, cannot fail in my judgment of giving great and lasting profits."

III.—The Marienberg embraces in a sett in perpetuity at a like royalty, 185 acres, and is traversed by numerous powerful lodes, productive of silver-lead ores, yielding in silver 26 ozs. to the ton.

Speaking of this mine, Capt. Toy says:—"Looking at this sett, I find that much work can be carried out, and a large area of land proved to a depth of 40 fms., without the aid of steam power."

The acquisition of these mines has been made on terms which some three or four years since would have been impossible.

As it respects the Aurora Mine, the great outlay in the erection of buildings and machinery, and the heavy expenditure in the long drive in the search for and development of the lodes, together with a wasteful system of dressing, absorbed the bulk of the rich produce; and death amongst the proprietors having taken place, a sale became inevitable.

The purchase money is £18,000—£7550 in cash, and £10,250 in shares.

Of this amount a net return from the reserves of lead in the Aurora Mine alone of £8250 is immediately available, representing, therefore, upwards of 40 per cent. of the purchase money; whilst the magnitude of the sett, its numerous and but slightly developed lodes, its buildings, machinery, and plant, together with the valuable setts of New Weisweiler and Marienberg, are very inadequately represented by the balance.

It is estimated that the lead reserves at Aurora will provide a steady and satisfactory dividend, pending the opening out of the many promising points referred to in the reports, and the development of the splendid discovery at New Weisweiler.

The directors base their remuneration upon a percentage on the net profits of the workings.

Application for prospectuses and shares to be made to the directors, at the offices of the company, No. 4, New Broad-street, London, E.C.

The LIST will be CLOSED for LONDON on SATURDAY, Jan. 18th, and for the COUNTRY on MONDAY, Jan. 20th.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

JOSEPH BICKERTON AND COMPANY (Limited).—Capital 10,000l., in shares of 10l. The acquisition of the company from Joseph Bickerton, the Richmond Hill Ironworks, in Oldham, Lancashire, together with plant and stock of same. The carrying on the trade of machinists in all its branches. The purchasing or otherwise acquiring any lands, buildings, &c. The subscribers are—J. Bickerton, Altringham, 2; J. Curedale, Oldham, 20; J. Robertson, Oldham, 5; B. Waugh, Oldham, 10; T. W. Ulph, Manchester, 5; A. Holme, Manchester, 2; G. Greenwood, Oldham, 1.

BERLANGA AGENCY COMPANY (Limited).—Capital 24,000l., in shares of 25l. The acquiring from Messrs. Moser, Levy, and Co., a contract made between the Berlanga Silver-Lead Mining Company (Limited) and Messrs. Moser, by which the latter were appointed factors and agents for receiving all consignments and making all sales of the products of the company's mines or works, carrying the said agreement into effect, and acting as factors and agents of the mining company. The subscribers (who take one share each) are—A. Morton, Manchester, merchant; A. H. Moses, 57, Cleveland-square, merchant; E. H. Moses, 55, Maids Vale, gentleman; A. A. Levy, 6, Fenchurch-street, merchant; M. Moses, 134, Westbourne-terrace, merchant; E. Hooten, 136, Church-road, merchants' clerk; R. Folkard, 58, Beaumont-square, merchants' clerk.

LLANSAUL LEAD MINING COMPANY (Limited).—Capital 30,000l., in shares of 5l. each. The purchasing of a lease of the veins, mines, lodes, and seams of lead and copper ore and all other minerals and metals under the land, containing 201 acres, known as Talley Domesne, Pansygarrey, Cil-lynfawr and Bulchrydyd, in Carmarthen. The adoption of a certain agreement made between J. H. Outhwaite and A. J. Groom, on behalf of the company. The acquiring by purchase or otherwise any mines, lodes, &c., and the carrying on the business of a mining company. The subscribers are—H. Robinson, East Moseley, surveyor, 5; L. Beck, Brockley-road, S.E., professor of music, 5; G. Crickmay, Barnes, stone merchant, 5; A. B. Weston, Putney, tea and wine merchant, 4; H. E. Pollock, 13, John-street, Adelphi, architect, 1; W. White, 3, West-street, assayer, 1; E. G. Wyatt, Hammersmith, architect, 4.

THE WEAR MARINE INSURANCE COMPANY (Limited).—Capital, 20,000l., in shares of 100l. For the insurance against every description of marine insurance, risk, fire, &c., and also generally to carry on the business of marine underwriting. The subscribers (who take five shares each) are—J. Laing, Sunderland; D. G. Pinkney, Sunderland; J. H. Culliford, Sunderland; J. Horan, Sunderland; W. H. Dixon, Sunderland; J. S. Barwick, Sunderland; J. G. Addison, Sunderland; T. J. Reay, Sunderland.

NEW ZEALAND AGRICULTURAL COMPANY (Limited).—Capital, 1,000,000l., in shares of 20l. To acquire lands in New Zealand, to work, manage, and develop same by farming, stocking, &c., erecting houses and buildings, &c. The subscribers (who take one share each) are—Julius Vogel, 127, Cornwall-road, S.W.; W. J. M. Larnach, 118, Holland-road, W.; R. Robertson, 12, Stanley Gardens, W.; W. Clark, 9, Victoria Chambers; P. Maxwell, Ryde; R. C. Mayew, 101, Queen's Gate, W.; T. S. Tancred, 1, Westminster Chambers.

JUNIOR ARMY AND NAVY STORES (Limited).—Capital 100,000l., in shares of 1l. To carry on the business of general dealers, and supplying articles of domestic consumption and general use to its shareholders and the public. The subscribers (who take 25 shares each) are—E. K. Money, 6, Lansdown Crescent; W. D. Harris, 21, Manchester-square; J. S. Hooper, Dulwich; A. H. Gilmore, Junior Carlton Club; W. Boileau, 31, Ladbrooke-square; J. W. Gambler, 2, Albion-street; E. Church, 80, Bishopsgate-street.

E. W. OAKES AND COMPANY (Limited).—Capital 30,000l., in 50l. shares. To purchase a business carried on by E. W. Oakes and Co. at the Washford Smelting Works, Attercliffe, Sheffield, and the good-will thereof, together with the plant, tools, stock in trade, contracts, &c. The carrying on the business of smelters, silver refiners, and brass founders, as carried on by the said firm. The subscribers (who take one share each) are—E. W. Oakes, Sheffield; Henry Pawson, Sheffield; W. Marsh, Sheffield; E. W. Oakes, jun., Sheffield; C. Wright, Worsborough; J. Gillies, Sheffield; J. C. Colver, Sheffield.

LUTON AND DUNSTABLE MORTGAGE COMPANY (Limited).—Capital 20,000l., in shares of 10l. To advance money on mortgage of freehold, copyhold, or leasehold hereditaments in Luton and Dunstable. The subscribers are—A. S. Ewen, Luton, 20; T. Stonner, Luton, 20; F. Shepherd, Luton, 10; E. A. Cumberland, Luton, 10; E. Ewen, Leicester, 20; S. W. Wheatley, Butlerston, 20; J. W. Cumberland, Luton, 10.

ANGLO-AMERICAN ELECTRIC LIGHT COMPANY (Limited).—Capital 15,000l., in shares of 10l. The acquire the agency for the supply or manufacture in Europe of the Farmer-Wallace Dynamo-Electric Light, and other analogous machines and patent wire; also of the Wallace lamps. To acquire by purchase or otherwise the several letters patent for improvement in electric lighting granted to John Scudamore Sellow, W. Ladd, and H. Edmunds, and generally deal with or dispose of the above, and any other patents, machinery, &c. The subscribers are—G. Mathey, 78, Hatton Garden, 250; W. Ladd, 11, Beak-street, 250; J. S. Sellow, 78, Hatton Garden, 250; H. Edmunds, Stoke Newington, 250; T. A. Roehussen, 28, Abchurch-lane, 50; E. Mathey, 78, Hatton Garden, 100; G. Newington, Lower Sydenham, 1.

RHYL COCOA-HOUSE COMPANY (Limited).—Capital 5000l., in shares of 1l. To establish houses, rooms, street stalls, and other places in and around Rhyl, and to carry on the business of general refreshment housekeepers. No wine, ale, or spirits, to be sold. The subscribers (who take one share each) are—R. Evans, Rhyl; T. Payne, Rhyl; J. R. Jones, Rhyl; J. O. Jones, Rhyl; D. Macgregor, Rhyl; R. S. Peet, Rhyl; J. Squires, Haydock; A. Rowland, Rhyl; J. Williams, Rhyl.

WEST-END HALL COMPANY (Limited).—Capital 10,000l., in shares of 1l. To purchase or otherwise acquire a building in Middlesex for the purpose of lectures, debates, entertainments, classes, &c., and generally to carry on the business of hall proprietors. The subscribers are—Annie Besant, Mortimer-road, 15; C. Bradlaugh, 20, Circus-road, 14; W. J. Ramsey, 20, Brownlow-street, 2; P. A. V. le Lubez, 68, Grove-road, 5; Robert O. Smith, 142, Old-street, 5; T. C. T. Parris, 9, Boscobel Gardens, 2; E. Truelove, 256, High Holborn, 1.

ROTARY ENGINES AND PUMPS.—Some further improvements upon his patent of 1875 have been patented by Mr. A. VACHEROT, of Battersea. In operating the sliding valves or pistons he now proposes to move them into and out of contact with the stationary boss within the revolving cylinder by means of stationary cams in lieu of by steam or other motive fluid. The cams may be formed by a groove in the frame, in which work rollers connected to the pistons or valves. He further proposes to use two radial stops or partitions carried by the boss, one of which is or may be perforated so as, whilst allowing the steam to pass through it in order to operate upon the piston or valve beyond it, to provide sufficient area to form an effective resistance or abutment for the back pressure of the steam. By this arrangement the advantage is obtained of what is known as "compounding" in engines, in which the exhaust steam is conducted from one cylinder into another of larger capacity, so as to render available to the utmost the motive power of the steam. It is preferred to employ a valve provided with suitable annular or semi-annular grooves and passages so arranged that by the act of

turning it from one position to another the steam pipe may be placed in communication with the port which has been serving as the exhaust port in the cylinder, and the exhaust pipe placed into communication with the port which has been previously used as the steam port in the cylinder, and the direction of motion of the engine reversed accordingly.

MIDDLESBOROUGH AND SCOTCH IRON.

SCR.—On Dec. 31 a year closed which was one of the worst, if not the worst, this district and the whole iron trade have ever known; a year of continued and increasing depression, characterised by heavy financial disasters, and without even a temporary feature of relief, ending with prices at a lower point than they have ever yet reached, and a general feeling of gloom and uncertainty.

In appending our annual statistics, and offering a brief review of the course of the iron trade for the year 1878, we may commence by remarking that Cleveland No. 3 pig-iron on Jan. 1 was at 40s., that with slight fluctuations it touched 38s. 6d. in October, after which the price rapidly fell away, and on Dec. 31 it stood at 34s. 6d. The makers' combination to uphold prices referred to in our last annual circular ended, as all such combinations have hitherto, in collapse and disaster to all concerned. It caused a heavy accumulation of stock, and when the inevitable end came prices fell more rapidly than they would otherwise have done, and the principles of supply and demand again ruled, as they must always do, the course of prices.

The production for the year was 2,023,177 tons, showing a decrease of 115,201 tons as compared with 1877, and the total quantity in stock on Dec. 31 was 337,337 tons, 248,139 tons being in makers' hands and 89,198 tons in storekeepers' yards, showing an increase over 1877 of 63,391 tons.

In the Manufactured iron trade there has been great depression, and a decrease in prices which may fairly be estimated at 12s. 6d. per ton on the average of all descriptions. The cost of production has been kept down by reductions in wages, the increased use of old rails, and the most rigid economy in all departments, but great difficulty has been experienced in obtaining specifications sufficient to keep the mills on full work. Plates and angle iron have been fairly active, bars dull, and iron rails, with a few local exceptions, entirely out of demand.

As was the case in 1877 great attention has continued to be attracted to the conversion of Cleveland iron into steel, and the best skill of the district continues to be applied to researches in this direction, and it is perhaps not too much to say that the talent and energy that are being brought to bear upon the question can hardly fail sooner or later to solve the problem that is fraught with such momentous consequences to the prosperity of the district.

In the Scotch Pig-Iron Trade we have to record a depressed and unprofitable year, the price of warrants having declined from 52s. 4d. on Feb. 4, which was the highest price reached, to 43s. 3d. on Oct. 3, the unexpected suspension of the City of Glasgow Bank having been announced on the previous day, and eventually to 42s. 3d. on Nov. 26, (which was the lowest point touched since 1852,) and since that date there has been a slight advance, the market closing on Dec. 31 at 43s. 6d. The stock shows an increase of 174,000 tons, being 679,000 on Dec. 31, as against 505,000 on the same day in 1877. The competition of Middlesborough has been severely felt during the year, and everything that is possible has been done by Scotch ironmasters to cheapen the cost of production, so as to enable them to compete without loss.

We forbear, in perilous times like the present, especially after such a year as last, when prices reached a very much lower point than the greatest pessimists ever anticipated, to touch upon the prospects of the future, further than to say that with both pig and manufactured iron at their present unusually low values, thereby affording every inducement to the employment of capital in industrial undertakings involving the use of iron, and also having regard to the recent extinction of rotten institutions, and a slightly clearer political horizon, we may reasonably expect as the present year advances a more improved condition of business generally.

TANSON, ARMSTRONG, AND CO.

Middlesborough-on-Tees, Jan. 7.

CLEVELAND.

Furnaces in blast, Dec. 31, 1877 ... 106	Stock of pig-iron, Dec. 31, 1877:—
Do., out of blast, do. ... 58	In makers' hands .....Tons 231,218
Total 162	In storekeepers' yards 42,780
Furnaces in blast, Dec. 31, 1878 ... 92	Total 274,000
Do., out of blast, do. ... 73	Stock of pig-iron, Dec. 31, 1878:—
Total 165	In makers' hands .....Tons 248,139
Production in 1877 .....Tons 2,138,573	In storekeepers' yards 89,198
Do., 1878 2,023,177	Total 337,337
Decrease 115,201	Total stock, 1877 .....Tons 273,916
	Do., 1878 337,337
	Increase—1878—Tons 63,391

SCOTLAND.

Furnaces in blast, Dec. 31, 1877 ... 86	Stock of pig-iron, Dec. 31, 1877:—
Do., out of blast, do. ... 60	In makers' hands .....Tons 336,940
Total 146	In storekeepers' yards 168,060
Furnaces in blast, Dec. 31, 1878 ... 91	Total 505,000
Do., out of blast, do. ... 63	Stock of pig-iron, Dec. 31, 1878:—
Total 154	In makers' hands .....Tons 479,583
Production in 1877 .....Tons 982,000	In storekeepers' yards 199,417
Do., 1878 902,000	Total 679,000
Decrease 80,000	Total stock, 1877 .....Tons 505,000
	Do., 1878 679,000
	Increase—1878—Tons 174,000

COLLIERY MANAGERS' CERTIFICATES.—A meeting of the Board of Examiners for Colliery Managers' Certificates of Competency under the Coal Mines Regulation Act, 1872, for the North and North-East Lancashire District, was held on Dec. 19, at Manchester: 60 candidates presented themselves for examination, and of these 17 obtained certificates, the remainder being referred back to their studies. The examiners present were:—Mr. J. Waddington, Burnley Collieries, Burnley; Mr. J. Ridyard, Walkden, near Bolton; and Mr. H. Fletcher, Ladyshaw Colliery, near Bolton; and the Hon. Secretary to the Board, Mr. Maskell Wm. Peace, Wigan, was also present. The following are the names of the successful students:—

Carrington, S. H., Cortonwood Collieries, near Barnsley.
Phillips, E. H., Newstead Colliery, Mansfield.
Banks, J., Stand Lane Colliery, Ratcliffe.
Dodd, M., jun., Fence Houses, Durham.
Gilechrist, J. R., Fence Houses, Durham.
Pemberton, N., Little Hulton, near Bolton.
Ridings, George, Little Hulton, near Bolton.
Stewart, A., Ardrossan, N.B.
Andrews, Thomas, Blackrod, Chorley.
Hallas, G. H., Hindley Green Colliery, Wigan.
Reynolds, J. J., Atherton Collieries, near Manchester.
Stones, T. H., Wigan Coal and Iron Company.
Files, R. B., Manor Colliery, Kearsley, Manchester.
Bonser, Harold, Newcastle, Staffordshire.
Scott, Alex., Pease's West Colliery, Crook-by-Darlington.
Kennedy, Matthew, Wigan Coal and Iron Company.
Brindle, Peter, Westoughton.

COLLIERY ENQUIRY.—Mr. H. C. Rothery, sitting with Mr. Thos. Cadman, Inspector of Mines for the South-West district, as assessor, has suspended for six months the certificate of Mr. Evan Foster, manager of the Ystradawr Colliery, Swansea, for gross negligence or incompetency, and endangering the lives of his men. The enquiry was held at Swansea, by direction of the Home Office.

ANTHRACITE COAL TRADE OF AMERICA.—According to the return of the Accountant of the Anthracite Board of Control the shipments from January to December 7 over the seven principal routes—Philadelphia and Reading, Lehigh Valley, Central of New Jersey, and Delaware, Lackawanna, and Western Railroads, Delaware and Hudson Canal, Pennsylvania Railroad, and Pennsylvania Coal Company—was 16,176,331 tons in the present year, against 14,450,303 tons in the corresponding period of the year 1877, showing a de-

crease of 3,238,172 tons. This decline is attributed to the operations of the coal combination, and it is remarked that had prices been steadily advanced and maintained as the combination intended, the decrease would have exceeded 4,000,000 tons. By advancing prices business was curtailed to an extent which made some of the companies dissatisfied, the result being that since September various companies have been secretly underselling, and the decline has been checked in consequence. It is justly remarked that this artificial and unnatural manner of managing a great industry has now again been demonstrated as an injury to the trade, and it is improbable that it will be repeated next year.

STREET'S INDIAN AND COLONIAL MERCANTILE DIRECTORY.

The new and revised edition—that for 1878-79—of this very useful Directory has just been issued, and affords abundant proof of great pains having been taken to secure accuracy. Although the volume is already well and favourably known, it may not be out of place to point out its principal contents. The various steam routes to the places treated of, with rates of fares and times of transit, are given, thus placing concisely before the reader the different facilities offered by the several companies. Particulars of the various railways in operation or construction are also supplied where practicable, so that the facilities offered for transit in each district can be readily seen. The London agents to each of the banks are named, so that a merchant is enabled to see to whom to apply where financial information or assistance is needed in connection with any particular town or city. Full particulars of the principal products are given, and articles which form the chief trade of each place, so that merchants can at once tell (guided by the customs tariff given) the class of shipments likely to prove most remunerative, &c. The number of towns and cities represented has again been slightly increased, and the proprietors mention that still more would have been included but for the principle by which they have ever been guided, never to give any information that is not, as far as all possible care and labour can make it, perfectly reliable. No important place, however, has been omitted.

Another feature in the present edition is the insertion of admirably executed maps of India, China, Japan, Eastern Archipelago, Mauritius, Australia, New Zealand, Tasmania, South African Colonies, Canada, South America, West Indies, and Central America. In these the object has, apparently, been rather to show the relative positions of the principal towns than to fill the maps with innumerable names of unknown villages or stations, so that they are at once clear and useful. The other merits of the work, such as the lists of the various traders, giving the merchant full particulars of possible buyers abroad, populations, extent of countries, and official information may safely be left to speak for themselves. The large amount of information contained, and the fact that the innumerable items of it have had to be collected in all parts of the globe—at Hong Kong and Montreal, at New Zealand and Vancouver's Island, as well as in the United Kingdom—leaves no doubt that a vast amount of labour has been bestowed upon the production of the work, whilst the printing and general work and maps must have involved an enormous outlay. All this, however, is well repaid by the result, the volume being one of the utmost utility to all engaged in business with India and the colonies.

EARLY IRONMAKING IN PENNSYLVANIA.

The numerous and interesting contributions to the siderurgical literature of the United States of Mr. JAMES M. SWANK, the secretary of the American Iron and Steel Association, are well-known to the readers of the *Mining Journal*, and he has now added an "Introduction to a History of Ironmaking and Coal Mining in Pennsylvania," which embraces a statement of the first enterprise in iron-making and coal mining in Pennsylvania, a reference to significant periods of their development, and a summary of ultimate results. Mr. Swank mentions that in the preparation of the book he has consulted all accessible printed sources of information which were deemed authentic, and in addition he has personally or by letter communicated with many persons who were likely to possess information concerning the early ironmaking and coal mining enterprises of the country. Upon many of the subjects treated of in connection with the history of early ironmaking in Pennsylvania, as for instance the first iron rails made in the United States, there was absolutely no literature to consult, and great difficulty was experienced in obtaining reliable facts from living ironmasters, family records, and other private sources.

With regard to the beginning of the iron industry in the United States, Mr. Swank shows that Virginia was the first colony to make iron in 1620. In 1619 the London Company sent workmen to Virginia to set up three ironworks. The enterprise was at once undertaken on Falling Creek, a branch of the James river, and not far from Jamestown. Here iron was undoubtedly made in 1620 and 1621, but on March 22, 1622, most of the workmen were cut off by the Indians, and the works were destroyed. No other attempt to make iron in Virginia seems to have been made for about 100 years. The next attempt to make iron in the colonies was in the province of Massachusetts's Bay. A furnace was erected in 1643 on the western bank of the Saugus by a company, of which John Winthrop, jun., was the leading spirit. The Carolinas made iron about 1715. North Carolina is entitled to the honour of having first given to Europeans the knowledge that iron ore existed in the American colonies; the discovery was made by the expedition fitted out by Sir Walter Raleigh in 1585.

Pennsylvania was one of the last of the colonies to begin the development of its iron resources, but it was also one of the last of the colonies to receive permanent settlers. The Swedes and Dutch, who were its first settlers, holding almost entire possession of its territory down to the granting of Penn's charter in 1681, probably made no iron within its limits, although there is a tradition that the Swedes made iron in Tinicum in Governor Printz's time from 1643 to 1653. Two years before the death of Penn, in 1718, the first ironworks were established in Pennsylvania. The event is briefly described in one of Jonathan Dickinson's letters, written in 1717, and quoted by Mrs. James:—"This last summer one Thomas Rutter, a smith, who lives not far from Germantown, hath removed further up in the country, and of his own strength hath set upon making iron. Such it proves to be as is highly set by, by all the smiths here, who say that the best of Swedes iron doth not exceed it; and we have accounts of others that are going on with ironworks." In Watson's Annals the statement is made that "the first built furnace of Pennsylvania was that of Colebrook Dale (Berks Company), built in 1720, by James Lewis and Anthony Morris, of Philadelphia."

Tracing the development of the iron industry of Pennsylvania Mr. Swank refers to the Durham Furnace in Bucks county, and also interesting accounts of the development of the Cornwall ore hills, the development of the iron industry of Eastern Pennsylvania, the first ironworks in Juniata Valley, and of the introduction of the various modern improvements. The volume is altogether a most useful and instructive one.

WORKING TRAVELLING TRAMWAYS.—The invention of the Rev. J. J. HALCOMBE, of Balsham, Cambridge, relates to the working of movable or travelling tramways or railways for vehicles to run on common roads. For this purpose he provides the carriage proper with two sets of wheels arranged for different gauges of tramway, and he causes these wheels alternately to run on and be supported by two pairs of tramways, also of different gauges, to correspond with those of the wheels. Each pair of tramways is carried by a separate frame, and the two frames are so fitted and arranged as to work the one within or upon the other. Each frame is provided with a suitable number of supporting wheels to run on a common road, and the tram lines are capable of being alternately raised and depressed so that as one set of wheels has completed its traverse on one pair of tram lines, and the other set of wheels are running on the other pair of lines. If desired the vehicle may be supported on one axle, in which case he employs a central trough-shaped tram

line for a central wheel fixed at one or both ends of the vehicle, in which case the said central wheel or wheels are formed so that the periphery thereof is capable of being supported by a movable rail connected to one of the frames, and working at the bottom of the trough of the central rail which is fixed to the other frame, whilst the sides of the central wheels are capable of running and being supported upon the sides of the said trough rail.

THE COPPER TRADE.

This metal shows a reduction of 20 percent in value as compared with prices at the commencement of 1878. A continuous fall went on throughout the year, the reaction being only on two occasions, and those of a momentary and merely nominal description. The imports in the year decreased nearly 4000 tons, and the exports increased about 5000 tons, while the stocks of all description show an increase of some 10,000 tons, thereby demonstrating that the constant reduction in the price of raw material has had a most depressing effect upon consumers, who practically hold 20,000 tons less copper than is usual with them. This state of things has been apparent throughout the year, all business being of the hand-to-mouth order, notwithstanding the Birmingham district was fairly employed. Consumers, however, have done well to reduce their stocks, seeing that copper has receded so much in value; 58s. for Chili bars must, however, be a safer basis to stock upon, and if, as is confidently believed on all sides, production at present prices will materially fall off, copper may again become a very good investment, and the reintroduction of some of the capital formerly employed in copper, would soon alter its value.

The imports of copper taken from the Board of Trade Returns for the 11 months of the past six years (estimated in fine copper), were as follows, in tons:—

1873.	1874.	1875.	1876.	1877.	1878.
64,163	65,576	72,129	71,720	83,918	80,215

The exports, including foreign, were—

1873.	1874.	1875.	1876.	1877.	1878.
49,383	54,527	45,216	47,104	48,758	51,444

The stocks of copper on the spot on Dec. 31, were—

1873.	1874.	1875.	1876.	1877.	1878.
28,592	20,668	20,553	25,533	31,393	37,890

The stocks including afloat and chartered, were—

1873.	1874.	1875.	1876.	1877.	1878.
35,563	29,722	25,975	34,326	38,713	48,474

The exports from Chili to Nov. 13, were—

1873.	1874.	1875.	1876.	1877.	1878.
36,798	41,733	41,369	44,314	38,416	42,300

The total chartered of West Coast produce for the year were 46,950 tons against 44,100 tons in 1877. The prices and stock on the 1st day of each month throughout the year, were as follows:—

	Price.	Stock on hand.	Stock, including afloat and chartered.
1878-January 1	2 66 0	31,388	37,713
February 1	2 66 0	31,305	37,769
March 1	2 65 0	33,235	40,535
April 1	2 63 10	34,345	41,480
May 1	2 62 0	35,416	42,735
June 1	2 64 10	37,410	42,809
July 1	2 64 0	35,983	41,782
August 1	2 61 10	38,913	43,325
September 1	2 60 15	38,676	44,365
October 1	2 60 0	39,097	47,757
November 1	2 57 0	39,712	47,567
December 1	2 59 0	39,008	47,073
and December 31	2 58 0	37,890	48,474

Leadenhall-street, London, January 9. HENRY ROGERS, SONS, AND CO.

The depression in the copper market continues, and in the absence of demand for manufactured from the ordinary centres of consumption, prices still tend downwards. It is evident there is more copper than the world at present is able to consume. The causes of this stagnation are many, prominent among them being the mistake made in the great time of inflation in 1873-74, when instead of saving the extra profits they realised, to serve in times of depression, many manufacturers put them into new works, and many of the merchants and working classes into new forms of personal expenditure. The consequence is that over production has brought on a collapse which there are few savings to meet. A continuance of low prices will bring things round again in time, by limiting production, and enforcing saving habits all the world over. We ventured to predict in February, 1878, that the quantity of copper raised would not in that year exceed the supply of 1877. Our anticipations have been fully realised, as reference to the Board of Trade Returns will show. Chili has, indeed, sent news of 2600 tons more copper chartered than in 1877, but we have reason to believe that the stock on the coast of Chili, in one large holder's hand, has been reduced in the past year by nearly 6000 tons, showing, as we anticipated, that low prices have begun to tell very materially on production in that quarter. Notwithstanding the proverbial badness of a prophet's trade, we shall hazard the prediction, that unless prices sensibly advance, our charters from Chili will not this year reach 40,000 tons, and that the low-produce ores and the pyrites will also show a marked diminution in quantity.

Exports—Twelve months.	1876.	1877.	1878.
English copper, wrought and unwrought	23,741	22,819	30,087
Foreign copper, unwrought	17,234	14,157	12,719
Yellow metal	12,753	17,064	14,573
Total exports	53,728	54,042	57,379
Imports—Twelve months.	1876.	1877.	1878.
Copper in ores	11,244	15,010	13,382
Do, regulus and precipitate	14,993	19,000	20,824
Do, bars, cakes, and ingots	39,145	40,216	39,360
In pyrites (estimated)	12,632	17,000	14,443
Total imports	78,014	91,226	87,269
Total stocks in Europe and afloat, Jan 1	35,000	42,300	52,300

King William-street, E.C., Jan. 9. RICKARDS AND BUDD.

THE TIN TRADE.

	Nov. 30.	Dec. 31.	Dec. 31.	Dec. 31.
	1876.	1877.	1877.	1878.
Straits and Australian, spot	5,845	5,124	8,220	7,278
Do, landing	632	317	371	370
Straits afloat	690	790	478	750
Australian, afloat	1,333	1,754	2,720	2,000
Banco, on warrants	1,704	1,562	1,173	1,086
Billiton, spot	1,582	1,810	1,200	1,047
Do, afloat	730	1,100	1,450	1,500
Australian tin in Holland	386	386	510	730
Total	15,852	16,843	16,159	14,741
Deliveries during the month in	1876.	1877.	1877.	1878.
London	975	894	690	906
Do, Holland	620	328	496	454
Total	1,595	1,222	1,176	1,360
* Also 256 tons overside to America.				
Shipments during the month from	1876.	1877.	1877.	1878.
Straits	500	575	90	450
Do, Australia	378	820	1,200	610
During	1876.	1877.	1877.	1878.
Shipments from Straits to London	3,815	2,901	6,047	6,930
Shipments from Australia to London	8,649	9,093	6,930	6,930
Deliveries of foreign tin in London	12,302	10,815	10,571	10,571

Banco in Trading Company's hands and afloat, 1925 tons. London, January 1. A. STRAUSS AND CO.

Tin continued to fall in value without hardly the slightest reaction from January to October last year, at which period prices had receded some 12s. per ton. A very sharp increase in value then occurred, and prices were run up in a very short space of time 13s. per ton. Depression again, however, overtook the market, and a considerable reduction in value was again the result, quotations being fractionally over 40s. only. The stock of tin is still excessive, and the near arrival of the Australian wool ships is likely to still further increase it; on the other hand, it is believed that the apparently permanent low range of prices must sooner or later affect supplies and the value of the metal accordingly. Tin-plates were cheaper during 1878 than at any previous period of their manufacture, but towards the close of the year they recovered about 15s. per cent. from the lowest value touched. The exportation of tin plates decreased so far as value is concerned about 10 per cent. as compared with 1877, but this decreased trade was consequent almost entirely from decreased value.

January 9. HENRY ROGERS, SONS, AND CO.

IMPROVED STEAM BOILER.—A peculiar form of boiler has been designed by Mr. S. J. GOLD, of Cornwall, Connecticut. It has a drop or well, from which radiate horizontal pipes, which are connected with vertical pipes which pass upwards through the flues of the boiler, and then discharge into the upper part, or steam room, of the boiler. The object of the invention is to provide a boiler in which steam may be generated in pipes, and delivered to the steam chamber without unduly agitating the water in the main portion of the boiler, and without the necessity of passing the steam through the water in the main portion of the boiler to get it into the steam chamber. The main portion of the boiler consists of a plain vertical cylindrical shell, having one or more concentric rows of vertical tubes, which pass through the top and bottom of the boiler. A cylinder projects downward from the centre of the head forming a well, the bottom of which is near the fire. Radial pipes are screwed into this cylinder, which pipes for convenience in putting them together are arranged in spiral rows. Upon the outer end of each pipe is screwed an elbow that receives vertical pipes which extend upwards through one of the vertical tubes first mentioned, and is connected with a short tube, which projects into the steam chamber through the head of the boiler. As many radial and vertical pipes are connected with the well at the bottom of the boiler as there are tubes in the outer row, but he does not limit or confine himself to this arrangement or proportion of pipes and tubes or flues. The boiler is set in a suitable arch or casing over a fire-grate, and in such relation to the latter that the fire is quite near the bottom of the well and lower rows of tubes. By this improved construction of boiler a great amount of

pipe surface is exposed to the action of the fire so as to generate steam first in the pipes. The steam thus made is conducted directly through the pipes to the steam room of the boiler without passing through the water contained by the body of the boiler. In this manner steam may be generated before the water in the main portion of the boiler becomes thoroughly heated. This feature is particularly valuable in steam fire-engines, and in the boilers of steam boats, and in other places where it is required to generate steam quickly.

MANUFACTURE OF IRON AND STEEL.

An improved process for readily and cheaply manufacturing a soft pure homogeneous iron, in character resembling Norway iron, and a strong pure homogeneous steel, similar to crucible steel, has been invented by an American puddler—Mr. DAVID THOMAS, of St. Louis, Missouri, and in practice it is said to have given very good results. The process consists in melting wrought-iron and cast-iron combined in suitable proportions with charcoal or other carbonaceous fuel until the compound (that is to say, of wrought and cast iron) is thoroughly melted and brought into the condition of a molten mass. A very hot air current (preferably at a temperature of 3500° or 4000° Fahr.) is then passed through all parts of the molten mass, and meanwhile the outer atmosphere is carefully excluded, and suitable chemicals, such as lye, soda, ash, manganese, and salt, are introduced into the molten mass. This subjection of the molten mass to the influence of the heated air is continued (say) 15 to 45 minutes, when the metal becomes purified to a remarkable degree, and thus steel or wrought-iron, as the case may be, of a very superior quality is readily produced. The apparatus used is of somewhat peculiar construction. A furnace is placed on posts, and is open at the top to receive the charge and to allow the products of combustion to pass off; but instead of allowing the latter to pass directly off into the open air they are first made to return from the furnace top downward, and around the outside of the furnace, thence to escape into a flue or flues. For this purpose the furnace proper is enclosed above and at its sides by a casing, which rests upon an annular plate that closely surrounds the furnace, and that in turn is supported by posts.

The casing is large enough in diameter to form an annular space around the furnace, which space serves as a flue to carry off the products of combustion. An exit flue leads from the said space or flue, through which the products of combustion finally escape to the open air. By thus enclosing the principal portion of the furnace, and causing the products of combustion to circulate around it before escaping to the open air, the furnace is not only kept very warm, but the outer air is effectually prevented from entering the furnace, and unfavourably affecting the character of the metal being made therein. The furnace proper immediately outside the casing is walled about with fire-brick, that rests upon the aforesaid plate, and the casing is composed chiefly of fire-brick contained in a shell. The hot-air blast may be produced in any desirable manner. He preferably, however, utilises the annular space as an oven, and by causing a pipe to wind around therein before entering the furnace, takes advantage of the heat escaping from the furnace to heat the air. The pipe is carried up and down and around in the said space until finally it is made to encircle the furnace. From this pipe two series of tuyeres lead into the furnace.

In charging a mixture of wrought and cast iron, together with charcoal, is put into the furnace through the doorway, which, excepting when the furnace is being charged, is kept closed by the door. The charge comes under the influence of the hot-air blast, entering through the upper tuyeres, and is brought into a molten condition. It falls or sinks as a molten mass, encountering the hot-air blast entering the lower tuyeres. This last-named blast operates to intensify the heat of the molten bath, and to increase the fluidity of the same. While the molten metal is under the influence of the blast suitable chemicals, such as concentrated lye, soda ash, manganese, and salt, are introduced into the molten metal. He uses for making iron about 1 oz. of each to 100 lbs. of metal, and for making steel a larger quantity of lye and manganese. If desired a third series of tuyeres, arranged at a still lower level, can be employed. The tuyeres are furnished with slides to enable the chemicals to be introduced into the furnace through the same. The lower part of the furnace is lined with blacklead to protect it from the heat.

MANUFACTURE OF TIN-PLATE.

The new method of manufacturing tinned plates, invented by Dr. Francesco Belluomini, consists in the substitution of refractory clay cases in the place of the cast-iron boxes hitherto employed for the annealing of the iron plates, and in use of colophony in the tinning process in place of grease or palm oil. The iron plate during the various processes it undergoes before being tinned becomes raw and brittle and is unfit for folding; in order to remedy this defect it is annealed in closed boxes of cast-iron in particular ovens for the annealing of closed vessels. The ovens having been heated for several hours are allowed to cool, and the hermetically closed boxes are only opened and the plates removed when cold. The continual changes of temperature cause a great consumption of the cast-iron boxes; in fact, Julien calculates on an average that there is an outlay of 1fr. 60c., or 1s. 4d., in boxes for every 100 kilogrammes of annealed iron plate, which would be equivalent to 81c., or 8d., for every case of tin-plate marked I G. It is, therefore, of the highest advantage in the manufacture of tin-plates that there should be found an economical method of annealing the iron-plate in closed cases made of a material which costs little, which stands fire better than cast-iron, and which effects equally useful results. The above results he has succeeded in obtaining by the adoption of refractory clay cases, which possess all the needed requirements.

The advantage of price which would result from the substitution of refractory clay cases in the place of cast-iron boxes for annealing the iron-plates may be calculated above 50c., or 5d., per case of tin-plate. The iron-plates in order to become tin-plates receive a coating of tin. Previous to the tinning process the iron-plates must be thoroughly cleansed from oxide, and to avoid the re-formation of oxide they are kept in water until they are to be tinned. As the plates would not take on the tin coating were they plunged wet with water into the tin, they have to be dipped into a substance which removes the water, and covers them with a coating, so as to protect them from oxidation.

Hitherto the plates have been immersed in grease or oil previous to being plunged into the tin-pot. By this method a kilogramme of grease or oil was consumed for every case of tin-plate. He has found that colophony produces the same effect, and can, therefore, be perfectly safely substituted for grease or oil. The great advantage of this discovery may be estimated by the fact that grease or oil costs from 100 fr. to 120 fr. per 100 kilogrammes, and that colophony costs on an average 24 fr. to 26 fr.; consequently there would be a saving of 60 c., or 6d., for every case of tin-plate. The cases for annealing the iron-plate should be made of refractory clay, should be solid, and of the same form as those of cast-iron. They should exceed in size by 15 c., or 5/8 in., in length, and by 5 c., or 2 in., in breadth the iron-plates they contain. When the plates are deposited in the cases the covers should be laid on and be made tight with clay to prevent the air from penetrating. The cases are then introduced into the oven, and are heated in the usual manner. The colophony should be of ordinary quality, and having been melted in ordinary pots employed for the grease it should be kept in a state of fusion. The wet iron-plates should be plunged vertically one by one into the resin pot, and be left there until the cessation of the ebullition produced by the water in the colophony. They should then be removed by means of tongs, and be immersed into the tin-pot. The remainder of the process should be effected in the ordinary manner.

ENGINEERING ACCURACY.—In the annals of the State of Pennsylvania, referring to the Pennsylvania State Improvements—main line—it is mentioned as a remarkable specimen of unusually accurate levelling that in a circle of 12 miles which was levelled the

error was only 1-2 ft. This was in 1824. United States engineers are engaged at present in running a line of levels between the Chesapeake and Delaware Bays for the purpose of determining the feasibility of a ship canal. In testing new levelling instruments furnished by the United States for the work (Heller and Brightly make) a line of test levels was run of over ten miles, and the difference of level on the closing bench mark was only 5-1000ths of a foot (0.005). It is also stated, with regard to American-made instruments, that those of Heller and Brightly, of Gurley, of Troy, New York, and of Stackpole, of New York, are driving English and French instruments out of the American market.

Meetings of Public Companies.

LITTLEDEAN WOODSIDE COAL COMPANY.

The half-yearly general meeting of shareholders was held at the Town Hall, Cinderford, on Dec. 31 (Mr. EDWIN CRAWSHAY, Chairman of the board of directors, presiding). The Secretary read the notice calling the meeting, and the minutes of the last meeting were read and confirmed. The accounts and balance-sheet as presented were passed and adopted. A vote of thanks was accorded to the Chairman and directors. The following report was presented to the meeting:—

The directors of this company are pleased to inform the shareholders that, although the deplorable state of the trade has been unprecedented, necessitating lower prices since the last meeting, they have been able to work the colliery without increasing the present liabilities, at the same time meeting the payments due to the building society, thus reducing their loan; this, compared with the working of other companies, and considering the very difficult and trying period (almost without precedent), must they think be satisfactory. The shareholders must bear in mind the directors were obliged to incur liabilities for the proper development of the colliery, and this debt against the company, as shown in the last balance sheet, incurred a heavy payment for interest. Could they succeed in paying these liabilities, and work the colliery without encumbrance, they have but little hesitation in saying they believe the property would be a regular dividend-paying concern. The shareholders must also bear in mind the liabilities are much heavier, by so much of the company's capital being still unissued, and which could be materially reduced if the shareholders would take up the unissued shares, or the state of trade allow the directors to dispose of them. Under these circumstances the directors have confidence the report must give satisfaction.

LISBURN SYNDICATE.—A meeting of this company was held at the registered offices on Dec. 20 (Mr. W. Bowman in the chair). When special resolutions were passed altering the name of the company to the Lisburn Mining Lands Company (Limited), dividing the capital of the company into 14,000 shares of 1s. each, in lieu of the 1400 shares of 10s. each, as the company was originally constituted. These resolutions were duly confirmed at the extraordinary meeting on Tuesday.

MARKET VALLEY.—The general meeting was held at Salisbury, on Wednesday, when the accounts showed a credit balance of £707. 15s. Capt. Wm. George and James Stenlake, report.—During the past quarter the 90 fm. level west has been continued without intermission, and driven 12 fms. 5 ft.; throughout which the lode has maintained a fair average size, and the character, as heretofore, is most promising, composed of quartz, prismatic, intermixed with mudiic and stones of copper ore of very good quality; specimens of that broken in the past fortnight we have thought it advisable to lay before you. We are pleased to remark here that the ground has further improved for driving since the last setting, so that good progress is now being made towards the run of disturbed ground on the back of the lode, under which we confidently expect to meet with another distinct shoot of ore to that from which our returns have hitherto been made. We have in addition to the above 10 stopes in different parts of the mine, by 36 men, yielding 35 tons of ore per fathom, and 15 tribute pitches, by 32 men, at tributes varying from 8s. to 13s. 4d. in 14.

ANTIOQUIA (FRONTINO) COMPANY.—At the adjourned meeting of shareholders, held at the offices of the company, Gresham House, on Friday (the Hon. F. C. Drummond presiding in the unavoidable absence of the Chairman of the company), the directors' report and accounts were taken as read. The Chairman of the company having at the meeting held on December 31 fully explained the present position and prospects of the mines the business at the adjourned meeting was of merely a formal character. Resolutions were passed that the directors' report be received and adopted, and the accounts passed and allowed. The Hon. F. C. Drummond and R. P. D. Money-penny, retiring directors, were re-elected; and Messrs. Waddell and Co. were reappointed auditors. A cordial vote of thanks to the Chairman and directors terminated the proceedings.

THE VAN MINES—MONTHLY REPORT.

Jan. 9.—As under please find my monthly report and setting list:—The 120 is driven 22 fms. 1 ft. west of shaft by the side of the lode; the ground in the fore-breach at present is comparatively easy for driving, and shows specks of lead occasionally; set to four men, at 80s. per fathom. The 105 west of shaft is communicated with the 100 winze sunk below the 90; set to six men, to drive west of the winze, at 120s. per fm. The part of the lode carried in this end is worth 1½ ton per cubic fathom for lead ore. The men from the winze are set to take down the lode to full width and put in stulls ready for stoping at a point about 90 fathoms west of shaft in the 105; set to eight men, at 60s. per fathom. The 105, east of shaft, is set to four men to drive, at 100s. per fathom; this level is driving upon a very kindly lode, but producing hardly sufficient lead to value. The 90 is now extended 127 fms. west of shaft; the lode in the present end is worth 3 tons of lead ore per cubic fathom; set to six men, at 180s. per fathom. The stopes in the back of the 90, east and west of shaft, are set as follows:—The 100 west is set to six men, at 45s. per fathom. The 90 west, to six men, at 50s. The 80 west, to eight men, at 40s. The 70 west, to six men, at 45s. The 60 west, to eight men, at 40s. The 50 west, to eight men, at 40s. The 40 west, to eight men, at 40s. The 30 west, to eight men, at 40s. The 20 west, to four men, at 40s. The 10 west, to four men, at 40s. These stopes are on the average 22 feet wide, and worth 2½ tons of lead ore per cubic fathom. The rise in the back of the 50 fm. level stopes is 5½ fms.; set to six men, at 180s. per fathom. The rise in the back of the 90 east at present end is completed, and the men removed to the 105 west, to drive the 95 fm. level cross-cut south into the soft in order to prepare for sinking a winze to ventilate the 120 when it reaches this point. The 75 fm. level west is now under Edwards' shaft; there appears to be a split in the lode at this point, and we have removed the men from this end to the cross cut north from the bottom of Edwards' shaft to drive that cross-cut thoroughly through the lode, and when this is done we want to drive a few fathoms along its course near the present end. The cross cut is set to four men, at 140s. per fathom. The cross cut south for the 75 permanent level is set to four men, at 80s. per fathom. The stopes in the back of the 75, east and west of shaft, are on the average 14 ft. wide, and are worth about 18 cwt. of lead ore per cubic fathom; these stopes are set as follows:—The 100 west, to six men, at 40s. per fathom. The 90 west, to eight men, at 47s. 6d. per fathom. The 80 west, to six men, at 50s. per fathom. The 60 west, to ten men, at 50s. per fathom. The 50 west, to eight men, at 50s. per fathom. The 40 west, to eight men, at 50s. per fathom. The 30 west, to eight men, at 40s. per fathom. The 20 west, to four men, at 40s. per fathom. The 10 west, to four men, at 40s. per fathom. The 50 east, to six men, at 50s. per fathom. The 40 east, to two men, at 50s. per fathom. The 60 permanent level west is set to four men, at 80s. per fathom. The stopes in the back of the 60, east and west of shaft, are on the average 13 ft. wide, and are worth 1 ton of lead ore per cubic fathom, and set as follows:—The 115 west to eight men, at 60s. per fathom. The 110 west to six men, at 45s. per fathom. The 72 west to eight men, at 50s. per fathom. The 64 west to eight men, at 55s. per fathom. The 56 west to eight men, at 60s. per fathom. The 48 west to four men, at 55s. per fathom. The 32 west to eight men, at 55s. per fathom. The 16 west to eight men, at 65s. per fathom. The stopes in the back of the 30, east of shaft, is set to six men, at 70s. per fathom; lode 13½ ft. wide, and worth for lead ore 1 ton per cubic fm. Surface: At surface we are pushing on as well as we can in the midst of frost and snow. Our sales take place to-morrow upon 300 tons of lead ore. When the weather breaks up we shall try to make up the deficiency. The machinery is all in good working order.—W. WILLIAMS.

COMPOSITION AND USE OF FURNACE GASES.—It has been ascertained that gases collected in the most heated parts of furnaces working iron and rapidly cooled differ completely from the results given by the analyses of Ebelen. This able metallurgist, ignoring the phenomena of dissociation, collected the gases by slowly aspirating them through a long tube which allowed the combination of the dissociated elements. In Ebelen's analyses the reaction nearly always appears complete, whereas the author finds that the fumes and carburetted gases may exist in the presence of oxygen, and at the temperature of molten iron. Gas collected above the grating of a furnace where the bricks were at a temperature of intense white heat, contained—Oxygen, 13.15; carbonic oxide, 3.31; carbonic acid, 1.04; nitrogen (by difference), 82.5 per cent. In metallurgical works the gases issuing from the furnaces are generally directed beneath steam generators, but they cool very rapidly against the sides of the boiler; so that after traversing about 50 ft. the temperature is lower

than 500°, and the gases then contain per cent.—Oxygen, 7.65; carbonic oxide, 3.21; carbonic acid, 7.42; nitrogen, 81.72. The quantity of oxygen has thus diminished by nearly one-half, and has been lost by its reaction on the finely-divided carbon which exists in great quantity in the atmosphere of the furnace.

DON PEDRO NORTH DEL REY (GOLD).

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—The shareholders in this now flourishing company are about to be rewarded for their patience and perseverance. The powerful pumping machinery, which has been so many years on hand, is now complete, and has succeeded in draining the mine, thereby enabling them to sink the sump and drive a cross-cut to intersect the lode at a greater depth. Two telegrams have recently been received—the first announcing that the lode had been intersected, giving good samples, and the next that the general samples were very rich. Independent of this magnificent discovery, they also have the rich courses of ore to work upon, and I observe by the last monthly report that Capt. Vivian, the indefatigable manager, hoped some of the stopes would be reached in the rich courses of ore and stoping resumed about the first week in November; and it appeared to me, judging from the enormous increase in the produce of gold cleaned up for the first division of last month, that those rich stopes have been reached. We may now look forward to seeing this company in the position it obtained some years ago, when they were making from 8000l. to 10,000l. per month clear profit, and paying 100 per cent. in dividends; and I think I may predict that before the end of the present year the same brilliant results will be achieved. I have at all times advocated this mine through your columns as being a good medium for a profitable investment, notwithstanding the opposition that has been manifested in various quarters, and I now have to congratulate my friends and clients who have invested in the undertaking through my earnest solicitation. JOHN S. HOUSTON.

Crosby Hall Chambers, London, Jan. 10.

THE WEEK.

SATURDAY, JAN. 4.—Railways showed great depression, and left off at a general fall. There was a decline of ¼ in Dover, A (12½), 14 in Brighton, A (27½), and 14 in Metropolitan (115). The feeling was not improved by the receipt of intelligence at noon that the old-established Cornish Bank of Tweedy, Williams, at Truro, had succumbed. Lower prices for most of the leading mines must now be looked for. The bank had been in existence over a century, and had a high local reputation. The liabilities are estimated at half a million and upwards. A few days ago the bank issued to its customers a circular intended to have a reassuring effect on learning that many contemplated with alarm the withdrawal of the interest of the late Sir F. M. Williams, but it seems to have induced a run, and so the doors had to be closed.

MONDAY.—Owing to the Cornish Bank failure both Dolcoath and Carn Brea were quoted 2½ lower. It might just as well have been 5, as there are no buyers. West Chiverton shares were quoted no better than 10s. to 20s. A large business was done in Don Pedro, Port Phillip, and Sierra Buttes, all closing firm. Railways were again flat. Metropolitan receded to 114, Midland to 120½, North Eastern to 181½, and Great Western to 93½. Egyptian Unified and Preference closed 1 lower.

TUESDAY.—It being stated that operations in the tunnel of the Eberhardt Mine had been resumed shares were in some request at 3½. Richmond fell to 10½; Kapanga being offered at 10s. Grand Trunk securities were a firm market, all the preference stocks closing ¼ higher. The first are now 34½; second, 24½; and third, 11½; the ordinary being quoted 6½ to 6¾. There was also an advance of ¼ in Erie, now 23½, and second mortgage, 7s.

WEDNESDAY.—The hopes of those who have been buying Metropolitan at 116, thinking the dividend might be 5½, were somewhat damped by the announcement that the distribution would be only 5 per cent., the same as last year. The stock closed at 113, or ¼ lower. Brighton, A, fell sharply from 125 to 123½. The National Discount Company announces the usual 10 per cent. dividend. Government Stock Investment will pay of 5 per cent. For mines, the principal feature was the heaviness of Richmonds, which ultimately closed at 10½, or ¼ down. The week's run was considered very disappointing. West Chiverton and Kapanga were both offered at 1's.

THURSDAY.—The Bank of England directors made no change in the rate to day, much to the disappointment of several who, seeing how cheaply discount brokers are now working, thought there would have been a reduction of ¼ per cent. at least. A telegram dispatched yesterday from the Don Pedro Mine speaks still more favourably of the improvement at the 40. Shares fetched 13 10ths and ¾ to day. There was once a very active market for them at 3l. and 4l. apiece.

FRIDAY (Opening).—The markets are inclined to be dull. British have fallen to 89, and Brighton A to 126½. In mines there is an active demand for Don Pedro, which are quoted 18s. to 20s. West Chiverton are being dealt in at 10s. and 15s. Richmond, 10½ to 10¾. Eberhardt, 3 to 3½. Port Phillip, 10s. to 12s. 6d. New Zealand Kapanga, ¼ to ¼. Leadhills, 1½ to 2½. The North Metropolitan Tramways announce a dividend of only 6½, against 9½. All tramway shares are dull, and most of them too high. National Safe, 3½ to 4. Pawson, 5½ to 6½. Royal Aquarium, 4½ to 4¾. Egyptian Unified, 50½ to 50¾; ditto preference, 70½ to 70¾. General Credit, 5 to 5½. Credit (A), ¾ to ¾. Two o'clock.—Prices have given way still further. Brighton A have fallen to 126, and Dover A to 121. North British are now no better than 88½. Chatham Ordinary, 4½ to 5; ditto Preference, 88½ to 88¾. Glyn, 11 5 16ths to 11 7 16ths. Great Eastern stock is lower offered at 10½. West Chiverton, 3½ to ¾. Devon Consols, 1½ to 1¾. Javali, 8s. to 7s. Glyn, 10s. to 12s. 6d. East Yarn, 1½ to 1¾. Roman Gravel, 6½ to 7. Tankerville, 2½ to 3½. Four o'clock.—Beyond an advance of 1½ in North Eastern to 134, no recovery is shown in home railways. Erie shares and Second Mortgage Bonds are slightly higher. Turks are down to 11½. Unified and Preference unchanged. Brighton A, 126 to 126½. Dover A, 121 to 121½. Chapel House, 2½ to 3. Newport Abercrombie, 3 to 3½. Tiverton Brewery, 4½ to 5.

FERDINAND R. KIRK.

ALMADA AND TIRITO CONSOLIDATED SILVER MINING COMPANY.

TIRITO.—Capt. N. C. Morcom, Nov. 4. No. 1 Lode: The lode in the end driving north has become valueless, and is for the time being suspended, and the men are put to stop the bottom of the level, where a productive lode has been discovered; this lode appears of a very irregular character as to productiveness; in fact, it is the case with all the mines in the district.

Nov. 11: During the past week a stope 12 ft. long and 5 ft. deep was sunk on this lode, which yielded a fair quantity of docile ore. The stoping will be continued until the ore gives out.

Nov. 18: In sinking on the course of the lode the past week it maintained its width, and to all appearance the usual ley.

Nov. 25: In the underground stope below tunnel level the lode is 3 ft. wide, solid and compact, and yields docile ore in paying quantities. This is the first lode intersected by the main tunnel level. It has been known as the first lode. It is not a distinct lode, and one independent of the Tirito, but an offshoot or branch of the parent lode—Tirito—and has been divided by the influence of a cross-course from the main lode. It has taken a different course to that of the main lode. It will probably be productive while it is in close proximity to the main body.

SAN PEDRO (part of Tirito).—Nov. 18: The stope in the back of tunnel level has not been very productive. It contains some very fine stones of green ore. The ground is easy to excavate. We expect as we get a little higher the value of the stope will increase.

Nov. 25: The lode in the back of the tunnel level at this point is not very productive; still there is a gradual improvement, there being more balls of ore met with. The stope is situated at the point where the first lode branches off from the main lode.

LA VIRGEN.—Nov. 4: This stope is productive of green and black ore. The green ore is found on the west side of the lode, and has a width of from 5 to 9 ft. (that is, the lode), and a length of 30 ft. A stope 6 ft. high has been put forth on the green part of the lode, and has been productive of a very fair quantity of good ore. Our next operation will be to take down the black ore part of the lode, which is about 3 ft. wide, and then to fill up the excavation with deads or waste from above. The length of ore ground on this part of the lode is very short, consequently we must push a trial drift through the poor part of the lode further north, where I am strongly impressed ore is to be found.

Nov. 11: The east part of the lode which has been taken down within the last few days was productive of green ore instead of black. The last stope on this part of the lode consisted of black ore. It has now suddenly changed into green. This lode makes parallel divisions, although it is the same lode as that known as the Providencia, but situated to the east of the Providencia stope.

Nov. 18: There has no change whatever taken place in this stope since last reported. A cross-cut is started to the east of tunnel level under the old Virgin in order to prove if there are any further east than has been already seen.

Nov. 25: The lode is taken down to such a height as is safe. We are now again driving back to the old Virgin in order to have the staff to fill the excavation in the new or present Virgin.

PROVIDENCIA.—Nov. 4.—On the whole there appears to be a little improvement in this large green ore stope, situated now near 50 ft. above tunnel level.

Nov. 11: The large green ore stope above tunnel level gave us in the past week a considerable quantity of good green ore and a little platanil. The stope is gradually improving, and appears to be making more ore ground towards the south.

Nov. 18: This stope is fully as good, and perhaps a little better, than it was last week.

Nov. 25: This still maintains its former value. It is productive of docile and export ore.

SAN JOSE SHAFT.—Nov. 4: A tackle has been fixed in San José shaft, and the roadway is being secured in order to work the little ore in sight on tribute. A considerable quantity of work has been done at this point heretofore, but attended with bad results. Judging from present appearances we have no bright future to anticipate at San José.

MINA GRANDE.—Nov. 4.—There is a slight improvement in the end driving north in this large green ore stope, the end south in the 15 having become poor, the men are put to stop the back of the level. There has been no change worthy of notice taken place in the back of this level. The old men's workings taking away from the back of tunnel level are productive, and yielding a considerable quantity of green and black ore. Our hope is that the old workings will long be a source of profit to us.

Nov. 11: The end driving north of the big black ore stope contains a little more

ore than when last reported, but not sufficient to value. The stopes in the back of the 15 fm. level have been productive of good ley black ore.

Nov. 18: The lode in the end north of the black ore stope has greatly improved, worth 3 tons of ore per fathom. Judging from present appearances, it is probable the ore may last until we reach the old winze, which is about 10 feet to the north. The old workings, which have been before referred to, are giving satisfactory results.

Nov. 25: The end driving north of the big stope, below tunnel level, is worth fully 3 tons of ore per fathom. The lode is getting larger, or has taken a stronger course west.

CRUZ VERDE.—Nov. 4: The end driving north is still productive of green ore; the stope has fallen off a little in value. The end driving south has a branch of very good ore; the ground is very hard to drive through. A little ore has been found in cutting down the shaft; part of the bottom of the shaft is in old workings, and a part solid ground.

Nov. 11: There is no change whatever to speak of in this part of the mine.

Nov. 18: The ore ground situated in the north end and back of the same is of the usual character. A stope has been put over the bottom 2 feet deep, which has taken away all the ore; still, the lode is large and well defined. The indications are that the ore is dipping south; consequently, we may expect to intersect the shoot in the shaft as depth is attained. The end south is communicated to the old level driven by former workers; at this point the ground is very hard and poor.

Nov. 25: There is no improvement in the ground north of the shaft; it appears that the shoot of ore is getting smaller as we advance north. The shaft presents some stones of ore. There are indications of our having nearly reached the bottom of the old workings; the ground south of the shaft has some good branches of ore, but the ground is exceedingly hard.

Nov. 11: **TRIBUTE PITCHES.** The tributers are taking a fair quantity of ore from their different points of operation. The old stulls or deads of the old working above tunnel level north of the Mina Grande shaft are still productive of good ore. Should there be a considerable amount of this class of stuff it will be a matter of great importance to us.

Nov. 18: The tribute pitches are still yielding a fair quantity of ore.

Nov. 25: A fair quantity of ore has been broken at the different pitches during the past week. The most interesting point of the tribute department is the old arches at Tirito, about 12 fms. below the surface and leading towards the Soledad. This has a very hopeful appearance, and although the lode in the tunnel level is not of any value in its course towards the Soledad workings from San Pedro, as it does not appear to make in depth, there is no reason whatever that it should not make a productive lode at a considerable depth below surface. As we get through the fault or cross-course we shall be better able to form an opinion on this subject. The indications are, however, very encouraging. The old heads North of Mina Grande are not so good as formerly.

J. H. Clemen, Nov. 4: The marked improvement in the Providencia and Virgen stopes will increase our bullion yield. All the solid parts of ore in the 15 (Mina Grande) are separated for shipment. The dredgy portions are sent to furnaces. There is no difficulty in securing a good chlorination roasting for these ores, they being mixed with acid ores to such an extent that the percentage of lead entering the ovens is low.

Nov. 11: **ORE GROUND EAST OF VIRGEN LODGE.** A cross-cut to prove this point has now been started, and will be vigorously pushed. The southern extension of the same lode will also be searched for as soon as possible.

Nov. 18: We have now the pleasure of reporting an improved position. The silver extracted from both docile and rebellious ore is increasing. A pile of fair-looking ore is being hammer-dressed for shipment. We yesterday weighed and assayed a clean up at the furnaces from a fortnight's run, result \$3000—\$500 more than I had reckoned on. We are about to construct a drying apparatus for wet ores, which will be a great help.

Nov. 25: I must corroborate my previous statements as to our improved position. Dec. 7: Telegram: "We have remitted you—Ores, \$1000; bullion, \$4500."

STONE BREAKING MACHINERY.

An improvement calculated to render the stone-breaker far more effective and economic than hitherto has recently been patented by Mr. WM. LESTER, of Minera, near Wrexham. It consists of an improved method of giving motion to the movable jaw, and also in constructing the fixed jaw so that it can be reversed end for end and face for face, and its position adjusted as required. For this purpose, in carrying out the improvements, he suspends the movable jaw upon an axis supported by the side framing of the machine. At the back, near the lower end of the movable jaw, an axis is supported, and revolves in suitable bearings, and on the centre of the axis an eccentric is mounted, which in its revolution acts against the back of the jaw to force it towards the fixed jaw, and thus crush and break the stone between them in the usual manner. The movable jaw is drawn back by a spring or otherwise. The fixed jaw is so formed in one solid piece that it can be reversed end for end in order to equalise the wear upon the wearing surface from time to time, as may be required. The working faces of the fixed jaw can also be reversed.

This method of adjustment enables the otherwise fixed jaw to be removed, reversed, and changed with the greatest ease, and the jaw is so made as to work with the one face as a road stone-breaker and with the other as a crushing jaw; it has also the additional advantage of working with either end, thus giving in one piece the equivalent of four fixed jaws. The usual revolving screen is substituted by a simple arrangement in attaching a moveable screen to the jaw, which gives it a riddling motion, enabling the dust to be taken out most effectually. The moveable screen and trough can be used or not as desired. The position or angle of the fixed jaw in relation to the movable jaw may be adjusted as required by means of a bar, which can be slid through openings in the side frames of the machine, so that the lower end of the jaw rests against the back of the bar, the width of which can be varied to suit the angle at which the jaw is to be placed.

The alleged advantages of this improved construction of stone-breaker are—Cheapness of production in consequence of the less weight of metal required; extra strength in the working parts, and the simple and easy method of changing or renewing them; its compactness and portableness; the extra power gained by the direct action of an eccentric at the point most required for crushing by the movable jaw; the simplicity and strength of the regulating or adjusting arrangement by means of a removable bar, which opens or closes the otherwise fixed jaw; the complete and powerful direct eccentric crushing action without any complicated joints, pins, screws, toggles, or adjusting wedges, the eccentric shaft bearings only requiring hard metal or brass.

MINERALOGICAL SOCIETY OF GREAT BRITAIN AND IRELAND.—A general meeting of members was held at the Meteorological office, Victoria-street, on Tuesday, Jan 7 (Mr. H. C. Sorby, F.R.S., president, in the chair), when the following papers were read, or taken as read:—"On Pilotite, an Unrecognised Species," by Prof. M. F. Heddle, M.D.; "On so-called Green Garnets from the Urals," by Prof. A. H. Church, M.A.; "On the Magnetism of Rocks and Minerals," by J. B. Mannay, F.C.S.; "On the Celestine and Barytocelestine of Clifton," by J. N. Collie, communicated by W. W. Stoddard, F.G.S.; "On some Silicates of Copper," by W. Semmons; "Contributions towards a History of British Meteorites," by Townshend M. Hall, F.G.S.; "Notes on some Crystals of Iron," by Amos Beardsley, F.G.S.; "Notes on Massive Cronstedtite from Wheel Jane," by A. K. Burnett, F.G.S. A large number of members and associates were elected by the Council previous to the meeting.

DISTRESS IN CORNWALL.—Mr. Herbert W. Fisher, Vice-Warden of the Stannaries, has sent a cheque for ten guineas to the Mayor of Truro, and writes that he understands there is a great amount of distress amongst the Cornish miners, and not hearing of a central relief fund, he sends the amount to Mr. Chirgwin to distribute in the districts where it is most wanted.

CHEMICALS, MINERALS, AND METALS.—Messrs. J. Berger Spence and Co. (Jan. 4).—Alum: Loose lump, 6l. to 6½. 2s. 6d.; ground, 6l. 15s.—Arsenic Best white powdered, 8l.—Borax: Refined, English, 36l.—Copperas: Green, 52s. 6d.; white, 5l. 7s. 6d.—Copper: Sulphate, 15l. 7s. to 18l. 10s.—Nitrate of Lead, 31l. 5s.—Saltpetre: Refined English, 25l.—Sulphate of Zinc, 12l. 12s. 6d.—Sulphur: Roll, 8l. 15s.; flowers, 10l. 15s.—Tin crystals, 5½d. per lb.—White Lead, 20s. 5s.—Barytes: Carbonate, 100s.—Brimstone: Best thirds, 4l. 17s. 6d.—China Clay, 39s.—Oxide of Zinc, 23l. 10s.—Talc, 5l.—Umbur, 70s.—Charcoal: Best stick, 4½d. per bushel; field burnt, 6d.—Globe Steam-Boiler Powder, 16s. per cwt.—Naphtha, 60 per cent., 2s. 6d.

Petitions have been presented to the High Court of Justice for the winding-up of the Credit Company, the Credit Foncier (Transferred Assets) Company, the Petroleum Company of Italy, and the Wernipill Colliery and Fire-Brick Company.

HOLLOWAY'S OINTMENT AND PILLS—INDISPENSIBLE REMEDIES.—In the use of these medicaments there need be no hesitation or doubt of their cooling, healing, and purifying properties. The ointment stands unrivalled for the facility it displays in relieving, healing, and thoroughly curing the most inveterate sores and ulcers, and in cases of bad legs and bad breasts they act as a charm. The pills are the most effectual remedy ever discovered for the cure of liver complaints, diseases most disastrous in their effects, deranging all the proper functions of the organs effected, inducing restlessness, melancholy, weariness, inability to sleep, and pain in the side, until the whole system is exhausted. These wonderful pills, if taken according to the printed directions accompanying each box, strike at the root of the malady, stimulate the stomach and liver into a healthy action and effect a complete cure.

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WATSON BROTHERS' MINING CIRCULAR.
WATSON BROTHERS,
MINEOWNERS, STOCK AND SHARE DEALERS, &c.
1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON.

Ten years ago the weekly information which had previously been published for a great number of years in *WATSON BROTHERS' Mining Circular* was transferred to the columns of the *Mining Journal*, with the following announcement; which is now reproduced in consequence of the numerous letters and enquiries handed to them of late in reply to one which appeared in the *Journal* on the Clementina Mine.

In the year 1843, when mining was almost unknown to the general public attention was first called to its advantages, when properly conducted, in the "Compendium of British Mining," commenced in 1837, and published in 1843, by Mr. WATSON, F.G.S., author of "Gleanings among Mines and Miners," "Records of Ancient Mining," "Cornish Notes" (first series, 1862), "Cornish Notes" (second series, 1863), "The Progress of Mining," with Statistics of the Mining Interest, annually for 21 years, &c., &c. In the Compendium, published in 1843, Mr. WATSON was the first to recommend the system of a "division of small risks in several mines, ensuring the success in the aggregate," and Messrs. WATSON BROTHERS have always a selected list on hand. Perhaps at no former period in the annals of mining has there been more peculiar need of honest and experienced advice in regard to mines and shareholding than there is at present; and from the lengthened experience of Messrs. WATSON BROTHERS they are emboldened to offer, thus publicly, their best services and advice to all connected with mines and mining.

Messrs. WATSON BROTHERS are daily asked their opinion of particular mines, as well as to recommend mines to invest or speculate in, and they give their advice and recommend mines to the best of their judgment and ability, founded on the best practical advice they can obtain from the mining districts, but they will not be held responsible, nor subject to blame, if results do not always equal the expectations they may have held out in a property so fluctuating as mining.

The great extension of mining business, the difficulty so often complained of by country shareholders in getting accurate and disinterested information as to the state of Cornish and Foreign Mines, and of the financial and real position of mining companies generally, have induced Messrs. WATSON BROTHERS to make their Circular now published in the *Mining Journal* more extensively known, and to state—

That they issue daily to clients and others who apply for it a Price List (as supplied to most of the London and country papers), giving the closing prices of Mining Shares up to Four o'clock.

They also buy and sell shares for immediate cash or for the usual fortnightly settlement in all Mines dealt in on the Mining and Stock Exchanges, at the close market prices of the day, free of all charges for commission. They deal also, on the same terms, in the Public Funds, Railways, Telegraphs, and all other Securities dealt in upon the Stock Exchange.

Having agents in all the mining districts, they are constantly getting mines inspected for their own guidance, and will also obtain special reports of any particular mine for their clients, for the inspecting agent's fee of £2 2s.

"As many men, so many opinions," is an old saying, and one very applicable to mining operations, and it often makes us think of the late Capt. Dally, of St. Austell, an experienced and successful miner both at home and abroad. We had been having a tour through the mining districts in 1861, and speaking to the old gentleman upon the various and distracting opinions we had heard of different mines, he said, "I form my own opinion, and I speculate with my own money upon it," and we came to the conclusion that it was the best thing to do when one could rely upon oneself, and the next best plan was to get an honest and good agent and rely upon him if you felt he was right and trustworthy. Many years ago, and long before we made the acquaintance of Capt. Dally, an agent who considered himself a great practical authority inspected East Basset and told us and our friends that "he would eat all the copper we ever found in the mine," and considering that East Basset had been our pet recommendation, and that we had bought up all the shares we could get for ourselves and friends at about 10s. each, the positive opinion of the practical was rather alarming; indeed, it frightened out of the concern several of our friends, and shares dropped to 5s. each. We held on, however, and stuck to the opinion of Capt. Nancarrow, the resident agent, who never lost faith—he is still alive to give an honest opinion if required—and within a few months of the practical's condemnation we had the pleasure of seeing shares rise from 5s. to 300s., and in a short time the mine paid 58,000l. in dividends from copper. The fact is, although inspectors can form a pretty correct idea of mineral veins from their appearance, direction, and general characteristics, looking also to the nature of the rock in which they are embedded, no hard and fast rules can be laid down respecting them, and the worst guides are men with local prejudices, and mere geological theorists.

Mineral veins are very capricious indeed. Treasuries used to be the standard for all copper mines, and as its great riches were found in a basin of granite, and the lode split up and became poor wherever it reached the killas or clay-slate, practical men with local prejudice and experience condemned all copper mines in killas. Wheal Basset, a very rich mine for copper, made in granite, 15 fms. or 20 fms. below the killas in which it was poor. A parallel lode in North Basset made rich in the killas, and when it reached the granite at about 120 fms. deep became poor—just reversing the old idea. At East Basset a continuation of a lode which was making in the granite at Basset was in killas, and, therefore, as we have said, was condemned for this and other reasons, by men who merely relied on prejudice; yet it made all its riches in killas, and became poor when the bottom level reached the granite. Cross-courses, however, are necessary to make ore, and all our large deposits have been found near them. In Basset this was especially the case. In East Basset there was a large elvan dyke through which the lode passed in the 50 before it reached the granite. The late Capt. Chas. Thomas, of Dolcoath, had three leading features for productive lodes—the geological character of the locality, the general appearance, contents, and size of lodes, and their bearing or direction. To the latter he attached great importance.

The moral of all this is that the more one asks general advice, the more confused he will get, especially if he relies upon local or geological prejudice and mere self-interest. For our part, like Capt. Dally, if we form our own opinion we speculate with our own money upon it, at the same time that we advise others to do the same.

It used to be considered that tin could not be raised in Cornwall under 50s. per ton, but the fact that four mines are now paying good dividends with tin at 40s. shows, we think, that greater economy is practised in working them, and the question of labour and cost of working mines generally is becoming one of considerable interest and importance. In 1843 the rate of wages in Cornwall was for tributaries 2s. 15s. to 3s. 11s. 7d. per month; tutwork men 2s. 10s. to 3s. 1s. 11d.; surface labourers, 2s. 2s. to 2s. 5s.; boys, 13s. to 14s. 8s.; females, 12s. to 18s. per month, and only 12 pay days a year. At this time it was calculated there were 112 copper mines at work in the county and in great prosperity, and they employed 60,000 persons, the tin mines 12,000. The amount of money paid in labour was estimated at 900,000l. a year, and expended in material 300,000l. At present when mining is at the lowest possible ebb men want their 4s. to 6s. a month, and 13 pay days a year.

SENTINEL.—A correspondent informs us, in reply to "A. X.," that the Capt. Edwards referred to is John Edwards, of Grampound, who has had the management of lead and silver mines in Mexico, as

well as holding a position in Algeria under the Wigan Iron Company, and now, "having sweated" in a tropical heat, has returned to cool himself in Pyrenean snows, much to the sorrow of the Wigan Company, and the satisfaction of the Sentinel directors. We think, however, he will have warm work to return 680 tons of galena in six weeks, and when we are told the value he puts on the lode means 20 tons of galena and not "vein stuff" per fathom, of course he could not refer to a "cubic fathom." Our correspondent further adds that "if gentlemen knew France and the 'inside' of Imperial speculations before 1870 they would not be surprised that no Frenchman cared to touch the property, and that an Englishman bought it."

RICHMOND.—We understand that the agent recommended by Messrs. John Taylor and Son, and sent out specially to inspect this property for the company, has returned; but why his report has neither been made public nor sent to the shareholders is more than we can say.

M. WILLIAM H. H. WATSON having had some years' experience in Practical Engineering and Mining in Cornwall, as well as two years' practice in the London Stock and Share Markets, begs to offer his advice and services to Shareholders and Intending Investors in Mines, and in the Purchase and Sale of Shares.
Address: W. H. H. WATSON, 1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON, E.C.

Mining Correspondence.

BRITISH MINES.

ABERLEYN.—John Roberts, Jan. 8: I am very pleased to inform you that we have held the rise to the middle or No. 2 adit, which is a distance of 17 fathoms, making that height of backs for stoping; the lode, as far as we have been able to see it in the rise, looks well for blende. The end driving south in middle adit looks also well for blende, and we have raised a great many tons in driving this level to meet the top of the rise. The winze in the bottom of No. 1 adit is without change; I shall be inclined next setting-day to put two men more here to hasten on a communication with the No. 2 adit, and open all the stopes we can against the machinery goes to work. Considering the inclemency of the weather, we are getting on exceedingly well with surface work. Everything is now ready for laying down the plant except the upper floors, the excavating and walling of which I have let per contract for 10l. The crusher and other things are at the station, and I shall get them on the mine as soon as ever the snow has gone.

BELL VEAN.—John Brokenshire, Jan. 7: We are using every exertion and making good progress in driving the deep cross cut south from Mitchell's shaft towards Gobbins' lode, and the ground is most favourable. We have spots of copper, munda, tin, &c., in the country, indicating that we have a rich lode ahead. This cross cut level will intersect other important lodes now found so rich in Wheal Comfort Mine adjoining this. At present we are not doing anything on Parkyn's lode, which has been opened for 25 fathoms in length, and about 300 tons of rich tinstuff raised from it, and now lying at surface. This lode is 17 ft. wide, very strong, will yield immense quantities of rich tinstone for the stamps, and prove a very valuable one. The ventilation being defective we have deferred driving towards the Penetrathal lode until the Bell shaft is cleared. I am satisfied we have a very valuable mine.

BETTS Y COED.—H. T. Haley, Jan. 8: Setting Report: To drive the deep adit east, by six men, at 43s. per fathom; the ground has become more settled, and the lode is greatly improved to what it was in the shallow adit, worth 30 cwt. of lead per fathom. To drive the shallow adit east, by four men, at 45s. per fathom; the lode here will produce 15 cwt. of lead per fathom. To sink a winze in the bottom of the shallow adit, by four men, at 55s. per fathom; lode yielding as far as can be seen 20 cwt. of lead per fathom. This winze will come down on the deep adit about 20 fathoms in advance of the present end, and will lay open good stopes, as well as give good ventilation to this part of the mine. To drive the 20 adit, by four men, at 42s. per fathom; the lode here will produce 15 cwt. of lead per fathom, and in very congenial ground; I expect this end will improve going east, and as this is the deepest level in the mine is an important point. The tramway will be laid to this end to-morrow, which will greatly facilitate the working. The pumping wheel and rods to the western shaft work splendidly, and keep the water drained easily. We are getting on as fast as possible with the arrangements for pumping from the main shaft, and will lose no time in getting it to work. The weather for the past week has been much against our surface work, but the carpenters are getting on fairly with the dressing machinery, and shall quickly get to work provided the weather moderates a little.

BLAEN CAELAN UNITED.—Jonathan Pell, Jan. 8: Continued frost has prevented the water from being kept out of the bottom of the engine-shaft. The men have been cross-cutting the lode at the 20 fm. level, east of the winze, and cut a very fine branch of the lode, containing lead and copper embedded in large ribs of soft friable white spar; this portion of the lode is running 4 fms. north of the level, and contains as much as 100 tons of ore. The main portion of the lode dips north, whilst the winze from the 10 left the lode midway, and was sunk the last 5 fms. south of the lode, consequently the end of the 20 has been driven on a south branch and not the main portion of the lode. Since the present company was formed this portion of the working has remained untouched until the last three weeks, when the first prevented men working in the 30.

BLUE HILLS.—S. Bennett, P. Bennett, Jan. 4: The sinking of the Blue Burrow shaft has not progressed quite so fast during the past week, the ground being somewhat harder because of the large gossan passing through it. The shaft lode in the 30 east end continues much the same as last reported—worth 10s. to 12s. per fathom.

BODIDRIS.—H. Hotehills, Jan. 4: In the easternmost shaft sinking under the 45 I informed you in my last that we had a change in the character of the lode in the bottom of this shaft; since then we have had a few holes in the lode, which, however, is very jointy and difficult for breaking, but so far as seen is charged with blende, and on the hanging-side is a rib of steel-lead ore about 1 in. wide. I had a lump out of it to-day about 3 lbs. weight; this looks very promising, and speaks well as to the continuation of the runs of ore seen in the levels above. We shall in the early part of next week take down more of the lode, when I will let you know its character. There is no material change in the 45 end east with regard to mineral, but the lode is of such a promising character that any practical miner can but come to the conclusion that we must shortly meet with a good course of ore here. The 60, which was flooded in the early part of the week, is now clear, and the men at their work, but no change to note.

Jan. 8: In the rise in back of the 60 on Mass-y-P will the lode ground has become firmer and the lode more defined, imbedded in light limestone; the matrix of the lode is lime spar, mixed with blende—a promising-looking lode. In taking down the lode in the new shaft sinking under the 45 this week we broke some fair quality lead ore stuff for the dressing-floors, but the lode part being very spare for sinking I have ordered the men to sink by the side of the lode 1 fm. or so before taking any more lode down. This will be the best way to insure speed in the sinking, after which we can take down the lode by itself. I think, I think, very gratifying to know that the ore continues down, and there is no one will be more pleased to see a good body of it here than myself, and I hope next time to take more of the lode down I shall be able to report a further improvement. The 45 end east of that is looking equally as promising as last week, containing blende and spots of lead ore, but not sufficient to save. No change in any other part of the mine worthy of remark.

BWLCH UNITED.—Jan. 8: We have had a heavy gale, with snow and intense cold for nearly 24 hours; the roads between Capt. N. Bray's place and this are closed, so I do not expect him over to-day. I have just seen the pitman, who informed me the pumping wheel continued working until last evening, and had drained the mine nearly to the 70. The stopes in the 60 are opening out quite as well as hitherto.

CLEMENTINA.—J. Roberts, W. Sandoe, Jan. 8: We have cut down the shaft to the 15 below adit, cased and divided, and fixed ladders to surface, and the shaft will be quite complete to surface by Saturday. We just started the masonry wall for the bearings of the water-wheel, but the frost again set in, and we were obliged to stop it, and must await a change in the weather. The water-wheel is half way up the river from Conway, and will be in at Trefriw as soon as the weather will admit. We have two men stoping in the back of the shallow level, and the lode is looking very well.

COMBARTIN.—T. Harris, T. Comer, Jan. 9: There is no particular change in the 15 east to call for special remark since last reported. In the adit cross-cut the ground is of a larger character, consequently the men are able to make better progress. In the north west adit level the lode is from 3 to 4 ft. wide, containing nice veins of lead and blende, with white iron and quartz—saying work; a very kindly lode. We have got in our tramroad in the adit level, which will greatly facilitate our drive, and also enable the men to do their work with far greater ease than they have been doing hitherto.

DE BROKE.—J. Phillips, Jan. 8: A strong gale of wind yesterday, with snow and intense cold, has stopped our wheels for the time, but we had got the water close to the 35. The stopes in the back of the 25 is yielding 30 cwt. lead ore per fathom, and two others between the 25 and 35 are looking very promising, giving 25 cwt. lead ore per fathom on an average. The weather has moderated, and I hope to get the leads clear and the wheels at work in a short time, but as it is now high underground is not being delayed.

DENBIGHSHIRE CONSOLIDATED.—K. Prince, A. Francis, Jan. 9: There is no change in the 112 driving east. In the western level the vein continues to widen, and presents a better appearance than it has done for a long time past. The cross-cut from the 112 to intersect the lode proved in the 65 will not take as long to accomplish, when we expect large returns of lead ore. Dressing operations are suspended on account of the severe frost.

D'ERESBY CONSOLS.—J. Roberts, Wm. Sandoe, Jan. 8: In the end driving west towards Cobblers' lode the lode is a little larger than it was last week, and showing some small branches of spar crossing the end, with faces of lead, &c., but the ground still continues stiff and spare for driving.

D'ERESBY MOUNTAIN.—J. Roberts, W. Sandoe, Jan. 8: Monthly Report: We sunk and stoped in the bottom of No. 1 during the past month about 4 fms., and we calculate that we have raised close upon 3 tons of lead ore, and the lode is looking much the same as it has been. In the No. 3 we have raised about 1½ fms. through a good ore lode, and to-day the lode looks rather better than we have seen it. This is what we might expect if it be true of the report relative to the winze in No. 2—that the lode is worth 3 tons per fathom. No. 4 stopes is quite as good as we have seen it for months past, yielding a large quantity of good lodey stuff. In the sump to No. 5 we have done nothing of any importance owing to the water. It did dry, but as soon as we commenced again with clearing the floods came home and drowned us out, but we hope that we shall shortly be able to resume it. We have cleared and secured No. 5 about 10 fms.; we should have cleared very much more had it not been for the heavy floods of rain, which

not only hindered our working in the forebore, but brought away large quantities of stuff, and carried it back a great distance in the level which had been cleared, which, of course, we were obliged to re-clear. The new shaft, on the sump to No. 5, we have sunk 2 fms., and have reached the rock, and are now putting in the collar; when done we shall sink away with all speed. The Valley shaft we have cleared up to the bottom, as we have already advised you, but we prefer another site for the permanent shaft, where we may be able to sink in the softer rock, and then cross through the lode at any point that may be deemed advisable.

DEVON GREAT CONSOLS.—I. Richards, Jan. 10: Wheal Josiah—Inclined Shaft: In the 300 east the lode is 3 ft. wide, composed principally of capel and quartz. In the 250 east the lode is 4 ft. wide, composed of capel, quartz, and a little munda. Wheal Emma: New Shaft—New South Lode: The new shaft below the 190 is being sunk on the north side of the ore-bearing portion of the lode to facilitate sinking, and very fair progress is being made. In the 190 east the lode presents a very fine appearance, 5 ft. wide carried, being composed of quartz, peach, priam, and copper ore, worth 5 tons, or 18l., and 7 tons of munda per fathom. In the 190 west the lode is 5½ ft. wide, composed of capel, quartz, priam, and copper ore, worth 1 ton, or 3l., and 5 tons of munda per fathom. In Floyd's winze, in the bottom of the 175 east, the lode has improved, and is worth for length of winze (9 ft.) 5 tons of copper ore, or 21l., and 6 tons of munda per fathom. In the 175 west the lode is 4 ft. wide, and worth 2 tons of copper ore, or 6l., and 5 tons of munda per fathom. In Hockaday's winze the lode is 4½ ft. wide, being carried is worth for length of winze 9 ft. 2 tons of copper ore, or 6l., and 3 tons of munda per fathom. In the 160 east the lode is 2 ft. wide, composed of capel, quartz, munda, and a little copper ore. In the 130 east the lode is 2½ ft. wide, composed of capel, quartz, and a little of both munda and copper ore. In the Railway shaft, below the 160, the lode part carrying is 5 feet wide, composed of capel, quartz, peach, priam, munda, and a small quantity of good quality copper ore.

DUBBY SYKE.—Wm. Vipond, Jan. 3: I see no further change in the end driving east; as this week is the end of the month I think it would be best to rise into the limestone and prove of what value the vein is in it. We have now driven east from the rise 28 fms. 6 in.; driven this month 6 fms.

EAST CRAVEN MOOR.—D. Williams, Jan. 9: New Shaft from Surface: This shaft is sunk, cased, and divided to a depth of 14 fms. below the 42. We have commenced driving east and west upon the vein to day, which in both ends is fully 4 ft. wide, and producing 2 tons of lead ore per fathom. The cross-cut south from the 42 to the parallel vein is extended 22 fms. In the 56 the vein is 3 ft. wide, and producing stones of ore.

EAST VAN.—Wm. Williams, Jan. 9: We have crossed north 6 fms. into the lode at present end of the 70 west, but have discovered nothing of value. The cross-cut for the north lode now measures 20 fms.; the last 3 fms. has been through a lode the matrix of which I am sorry to say is so far uncongenial for lead ore, but we are pushing forward in hope of meeting something better on the heading. **GAWTON COOPER.**—George Rowe, G. Rowe, Jan. 4: The communication with the winze sunk below the 106 is now open to the bottom of the shaft at the 117 below, which has thoroughly ventilated the bottom part of the mine, and facilitated our operations in stoping away the ore ground between both levels, where the lode is worth 10s. and 12s. per fathom. The men are still engaged in opening the lode at the point of communication, where it is worth 10s. per fm. All other points are without change. Our last samplings of ore weighed off 195 tons 10 cwt. 3 qrs.

GLASGOW CARADON CONSOLS.—William Taylor, William J. Taylor, Jan. 6: We are making good progress with the 2nd cross-cut shaft; the ground continues favourable, and we expect to cut the lode shortly. No change in the 90 west on branch. In the 90 east the ground is easier, producing more ore and looking more promising than for some time; we hope this end will soon get into productive ground. The winze in the bottom of the 78 west, on north lode, is worth 5s. per fathom. The winze in the bottom of the 78 east, before the 90 east, is worth 25s. per fathom. In cross-cutting south from the 78 east we have much easier ground; we intend, therefore, to push on further south, hoping to find more lode in this direction. Midway west, on south part of lode, is worth 12s. per fathom; we are driving a cross-cut about 2 fms. further south to prove if this part of the lode continues on there. The stopes and pitches throughout the mine continue to turn out very well, varying in value from 1s. to 35s. per fathom. Our next sale of ore will be about 200 tons, which will be sold on the 23rd inst.

GLENROY.—R. Rowe, Jan. 7: In the 25 cross cut we have still strings of blende and copper, but no decided lode. In the shaft the lode is still more than the full width of the shaft; and to-day some good stones of blende came up from the centre of shaft, and there is more quartz in the lode, which we want to see. We shall sheath the shaft down after next week, so as to draw with the machine from the present bottom, and so hasten sinking at a reduced price.

GORSIEDD AND MERLlyn.—W. Edwards, Jan. 9: The south cross is in very hard ground, and there is no particular change to notice either in this or the cross-cut south. We have placed some tributaries in the 70 east, where there is a very fine rib of lead ore. In the rise in the 70 west there is splendid lead, which will turn out quite 3 tons to the fathom. Dressing operations are suspended on account of the severe frost.

GREAT HOLWAY.—Jan. 9: We have raised since our last splendid rocks of lead from Garsen shaft, some weighing at least 1 cwt., and we have now some very fine lead and blende on surface. There is every probability of the vein continuing to turn out well as operations are conducted upon it. We are unable at present to go on with the building of the engine house, but the carting of machinery from the station to the mine is progressing fairly. The severe frost does not much interfere with dressing operations.

GREAT LAXEY.—W. H. Rowe, Jan. 7: The sinking of the Welsh shaft below the 247 has been commenced, and the driving of this level continued northward. It can scarcely be expected that any regularly productive ground can be met with until the end has reached a point about 100 fms. below the sinking from the 235, which is nearly at the southern limit of ore ground, and on the hanging branch of the lode, the value for ore being very nearly as last reported. The 235 end north is without change to notice; although apparently letting down the whole feed of water, has not yet sufficiently drained the ground to permit the sinking of Dumbell's shaft without considerable expense in draining water, and we have, therefore, decided not to continue the sinking until the ground is properly drained. You will be pleased to hear of an important improvement in the 2nd end north, which, as you have already been informed, is now to be worked from the 310. This winze is sunk on the footwall part of the lode, leaving the greater portion on the hanging side, which we are now cutting through at the 225, and is worth so far 70s. per fathom. It is to be hoped the further cutting through will show a still greater width of ore. There is nothing of importance to report of the stopes throughout this part of the mine. Dumbell's: The 215 end north has again improved, now worth 25s. per fathom. In cutting through the full width of the lode in the 185 north the lode is worth 30s. per fathom, but the end or forehead hanging on the footwall side we have not yet reached them to get a good view of the bearing part of the lode. No particular change to notice in any of the ends or stopes above this part of the mine until we come to the 1,0 end driving north, which is now the pioneer or advance level in this direction. This end, as far as we can now see, seems to have penetrated at last a distinct run of ore ground, the lode showing features strong resembling the Deep mine; value for ore at present 30s. per fathom.—South Ground: The rise in the 185 south is worth 25s. per fm.; a stopes in sole of the 145, 30s. per fathom; another 22s. per fathom; and No. 3, in roof of 100, 30s. per fathom. On the whole, we consider the prospects of the mine have generally improved since last month's report, and bound to have a beneficial effect upon the returns.

GREAT RETALLACK.—T. Harris, Jan. 4: I have to-day re-set the level at the bottom of the boundary shaft to drive, by four men, at 2s. per fathom. The ground is a little spare for driving, but I like the character of the ground we are driving through, it being of light peach, with good patches of blende, and as we get near the footwall I expect to find a good lode of blende.

GREEN HURTH.—Wm. Vipond, Jan. 3: We have had no ore to value this week in the sump since we got through the thin plate mentioned last week. The east side of the sump is very much improved, and is now worth 10s. per fathom; we are evidently close to the main vein in this side. The sump is now down 9 fms. 1 ft., and still in hazle. Both workings on No. 3 cross vein have been very poor this week, but the one going north from the old vein is looking a good deal better to-day, likely to yield 5 cwt. of ore per fathom. I think a few more weeks will put the sump into the limestone below, with the vein productive in it. The spring will see us opening out a new mine as I may say at Green Hurth. We had a terrible storm of wind and rain on Tuesday, followed by a severe frost, which still continues.

HARWOOD.—W. Tallentire, Jan. 3: South End: We have had nice ore this week at the upper part of the limestone, where we are now driving; worth 7 cwt. of lead ore per fathom. We have intersected an east and west vein; I cannot form much calculation as to its size or the mineral that it contains until we further cut into it. We only met with this cross-vein yesterday at noon.

HINGTON DOWN.—T. Richards, Jan. 9: Bailey's Shaft: In the 172 east the lode contains apert, quartz, munda, and copper ore, worth 4 tons or 8l. per fathom, and has a very promising appearance. In the 174 west the lode is composed of capel, quartz, and munda, with good veins of lead. In the 175 east, in the back of the 172 east the lode is worth 6 tons of ore or 15s. per fathom. In the 160, west of Nicholl's winze, the lode is large and promising. In the tributaries' stopes and pitch in the back of the 110 the lode is exceedingly promising, and will produce 4 tons of ore or 6l. per fathom. In the deep adit the ground continues favourable, and fair progress is being made.

LADYWELL.—A. Waters, Jan. 7: In sinking the new south shaft below the 16 we continue to meet with hard ground; the lode lately has been filled with carbonate of lime and stones of galena, instead of the usual sort of limestone of ore and carbonate of lead, as formerly. When this change took place the underlay of the lode also altered from 2½ ft. in 6 ft. to about 4 in. in 1 fm., and it is, therefore, at present out of the line of the shaft; we shall continue sinking at the usual angle, it being likely that the lode will come out again to its old position as the mine is deepened. The winze below the said 16 fm. level about 3 fms. south of the shaft, is laying open a large lode, which is divided into four parts as follows:—A strong sparry ore course 2½ ft. wide on the footwall; then a cavity 1 ft. wide, the extent of which, lengthways and in depth, we cannot yet see; then a horse of hard rock 2 ft. wide, east of which there is a soft vuggy course 8 in. wide, composed of blue and white lead, against the hanging wall. This is a very promising looking lode, and taken in connection with the indications seen in the bottom of the above-named shaft, I consider it to be a very important feature in the mine. The 16 end, south of said winze, which is now over 5 fms. from the shaft, is opening out a lode 2½ to 3 ft. wide, composed of beautiful white carbonate of lime, and bright soft galena, the present yield being worth 14 to 2 tons per fathom. The country rock about the lode here, as well as the veinstuff itself, may be compared to the country and veinstuff seen at several points along the 55 on the Roman lode in Roman Gravel Mine. Should this improvement continue for a good length our prospect for getting ore will be a good one. There is no material change in the 32 south, west of old shaft, on new Britain lode. The tributaries are getting fair wages. The whole country around is still covered with snow, and the frost continues severe.

MELLANEAR COPPER.—John Gilbert, Jan. 8: The 30, west of Gundry's shaft, was driven 6 fms. 3 ft. last month; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 30, east from the top of the rise, was driven 2 fms. 6 in.; this level is communicated with the 20, west of Gundry's shaft. The 40, west of Gundry's shaft, was driven 5 fms. 2 ft. the lode is 2 ft. wide, and producing ½ ton of copper ore per fathom. The 50 fm. level, west of Gundry's shaft, was driven 2 fms. 5 ft. 6 in.; the lode is 3 ft. wide, and worth 1½ ton of ore per fathom. We expect this lode will improve soon, as it is getting better defined, and carrying two good walls, looking very promising. The 60, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth

2 tons of copper ore per fathom. The 70, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 80, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 90, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 100, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 110, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 120, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 130, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 140, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 150, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 160, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 170, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 180, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 190, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 200, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 210, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 220, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 230, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 240, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 250, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 260, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 270, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 280, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 290, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 300, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 310, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The 320, west of Gundry's shaft, was driven 2 fms. 0 ft. 1 in.; the lode is 4 ft. wide, and worth 2 tons of copper ore per fathom. The

No. 3 on section, east of Low shaft, is valued at 8 ows. per fathom. I have placed four men to cross-cut from the 25, almost immediately underneath the above, in order to see if we can discover the same sort of ore; we have not done much yet, and no ore to value. In driving from winze No. 7 on section, east of Gin shaft, the vein is very hard, but producing good stores of lead ore; value, 10 ows. per fathom. In driving west from winze, in No. 2 east from Low shaft, the lode is valued 10 ows. per fathom 4 fms. below the 25. We are cross-cutting from the old winze in No. 7 on section, east of Low shaft, into south part of vein, and also from the rise coming up from the 42 underneath, in order to prove the south side of vein, and also a road of communication between the two points. The rise west

A petition for the liquidation of the Landore Siemens Steel Company (Limited) was presented on the 2nd inst. by Dr. C. W. Siemens, the chairman.

PESTARENA UNITED.—The following are the returns of gold for the month of December:—From Val Toppa, 209 ozs. 17 dwts. 4 grs., from 546½ tons of ore; yield per ton, 7 dwts. 10½ grs. (this includes 12 ozs. 3 dwts. 8 grs. obtained from 27 tons of the above ore stamped by the 15th trial, as before advised). From Pestarena district, 114 ozs. 8 dwts. 18 grs., from 188½ tons; yield per ton

Richmond, 10 to 10½; the usual weekly telegram from the mi-

at Eureka, Nevada, states that the week's run was \$35,000 from 630 tons of ore, with two furnaces. The week's produce of the refinery was \$30,000. The latest report from the manager is dated Dec. 18, and states that there is no change of importance in the mine. The 600 cross-cut south looks very promising. The 1000 ft. level end, on the quartzite, is looking very favourable for ore. They have begun to open out on the ore body in the 500 and below, and as far as seen it is developing well. The furnaces had been started, and are doing well; all the machinery was running smoothly. The Eureka Sentinel states that "The mine is one of the greatest in the world, and the English public is beginning to realise it." Eberhardt and Aurora, 3 to 3½; a telegram from Capt. Drake states that he resumed driving the tunnel on Dec. 20.

The latest advices from the Comstock Mines state that at the Consolidated Virginia a small amount of ore is being extracted from the old ore stopes in the 1400 and 1500 ft. levels. It is likely that during the coming month the extraction of ore from the lower levels will be gradually increased as the repairs to the air connections are completed. The daily yield from the California is 360 tons. Everything is in good working order, a fair supply of winter necessities laid in, and a good winter's work may be looked for. The Sutor Tunnel has been extended in its south lateral drift towards the Julia shaft from the main tunnel 936 ft. The face is in fine-grained porphyry and vein matter, which blasts and works favourably. Temperature at face 102°, showing a slight increase of heat. The sub-train or canal through the main tunnel is in course of construction, and will be completed in due time. The New York Engineering and Mining Journal says:—"The Comstock stocks go down and down, the fact being that the rings controlling them have again squeezed all the money out of the foolish public, that for the hundredth time let itself be tricked by the familiar game. Comstock management has demoralised and impoverished the Pacific Coast, and is a standing disgrace. The Pacific slope—more particularly San Francisco—is reaping the bitter fruit of the shameless disregard for honesty or fair dealing which has long characterised her mine management, and has made 'Comstock management' a name to all honest people. Thousands of individuals and families have been ruined by this last 'squeeze,' in order that a few millionaires may increase their ill-gotten stores. If investors generally had heeded the warning so often repeated in these columns, and read the letters of our special correspondent, they would have carefully avoided Sierra Nevada and other Comstocks when they were 'kiting.'"

Placerville, 2½ to 2¾; the main shaft has at date of last advices reached the 400 ft. level, and a cross-cut towards the lode has been started. The winze going down below the 300 ft. level was still carrying a fine course of ore.

The Market for Hydraulic and Gold Washing Shares remains unchanged, though there has been a few enquiries for Blue Tent and others. The latest news from California speaks of the weather as being cold, with occasional showers, but the steady rain has not yet set in.

Lead Mines remain without material variation. Van, 17 to 18; the usual monthly report appears in another column. The mine is looking very well. Surface operations are hampered by the severe frost. The sale on Thursday—300 tons of lead—realised 3072½ 10s. Grogwinion, 1½ to 2½; the frost is still very severe, and dressing operations are much hindered. Frozengoh, 2 to 2½; capital progress continues to be made at all points, and particularly in sinking the shaft and driving the new cross-cut towards the south lode; in the latter place prospects of further early discoveries are considered promising. Wye Valley, 1½ to 2; the ore ground below the 22 is of a satisfactory character for permanent returns. West Wye Valley, 1½ to 2; the severe weather is much against good progress being made, but the prospects are improving.

Mineral Corporation of Great Britain, 10 to 11; it is remarked that although the company have been scarcely six months in possession of the property they have laid open a large quantity of ground and made important discoveries, of which the shareholders will soon receive the benefit. Capt. William Bennetts, reporting on the Hafnia Mine, says the No. 2 adit end is being driven by six men at 100s. per fathom; the lode is large and producing some good blende, mixed with lead, and is a very promising looking lode. The lode in No. 4 adit end is also looking very promising, and producing good saving work. He expects this adit to intersect the main north and south lode of the Whiteliff Mine. As to Great D'Eresby Mine, the deep adit end is strongly mineralised. Captain Wm. Bennetts recommends that an increased number of men should be employed here.

Rhydalun, 42 to 44; this mine is reported to be "opening out well, and promises to vie with the richest in the celebrated Mold district. This month they have sold 50 tons of lead, leaving a splendid profit." Pant-y-Mwyn, 3 to 3½; there is little business doing in these, but they are, it is said, likely to get better when the weather improves.

Pateley Bridge, ¾ to 1¼; the Rake vein in the end of the 30 east presents a masterly appearance favourable for further improvements, and is at present worth nearly 2 tons per fathom. The 20 east has also every feature of an early improvement. A pump winze has been started below the 30, the lode in which is worth 10 tons of lead ore per fathom, and appears to be improving as depth is attained. West Pateley, 1½ to 2½; satisfactory progress continues to be made at the various points of operation.

Subjoined are the closing quotations:—

Devon Consols, par to ½ prem.; East Caradon, ¾ to ¾; East Van, 1¼ to 1½; Glenroy, ¾ to ¾; Glyn, ¾ to ¾; Great Laxey, 17 to 18; Leadhills, 1½ to 2½; Marke Valley, ½ to ¾; Parys Mountain, ¾ to ¾; Pateley Bridge, ¾ to 1¼; Roman Gravel, 6½ to 7; Tankerville, 2½ to 2¾; Tincroft, 7 to 8; Van, 17 to 18; West Chiverton, ¾ to ¾; West Pateley, 1½ to 2½; Wheel Greenville, 2 to 3; Almada and Tinto, 1-16th to 3-16ths; Birdseye Creek, ¾ to ¾; Blue Tent, 2½ to 3; Cape Copper, 20 to 30; Cedar Creek, 1-16th to 3-16ths; Chontales, ¾ to ¾; Don Pedro, ¾ to 1¼; Eberhardt and Aurora, 3 to 3½; Exchequer, ¾ to ¾; Flagstaff, ¾ to ¾; Frontino and Bolivia, 2 to 2½; Hultfall, 3 to 3½; Javali, 3-16ths to 5-16ths; Kapanga, ¾ to ¾; Last Chance, ¾ to ¾; New Quebrada, 1½ to 1¾; Placerville, 2½ to 2¾; Richmond Consolidated, 10½ to 10¾; St. John del Rey, 265 to 265; Sierra Buttes, 1½ to 1¾; South Aurora, ¾ to ¾; United Mexican, 2½ to 3½.

Mr. Alfred Good, the official liquidator of the United Ports and General Insurance Company, intimates that a further dividend of 5s. and 1s. in the pound (according to the class of assets on which they rank) is now payable to the creditors of that company, at his offices, Poultry.

With this week's Journal a SUPPLEMENTAL SHEET is given, which contains—Original Correspondence: Burning Petroleum (Field, Field, and Cotton); On Compressed Air Machines; Rock-Drilling Machinery (B. Edwards); Tamping Shots (R. T. Moore); Richmond Mine—A Review of the Situation (W. Gabbott); Mining Prospects on the Pacific Coast; Gold in India (E. Harris); Geology in Northumberland (G. Attwood); Lead Mining in the Christof District; Welsh United Mines (A. Francis); Cardiganshire Mines; the Distress in Cornwall—Strikes; Devon Great Consols (R. Symons)—the Scotch Mining Share Market—Dunbar's Brick Kilns (illustrated)—Steam Heating for Towns—Foreign Mining and Metallurgy—Patent Matters, &c.

THE TITLE-PAGE AND INDEX to the FORTY-EIGHTH VOLUME is also given in this week's Journal.

PHENIX.—We learn by telegram that an important discovery has been made at this mine:—"An excellent course of copper ore cut at the 100 ft. level in whole ground from surface. A fine course of tin in the 120 ft. level."

WEST PATELEY (Lead).—Good progress continues to be made in the 56 west to communicate with the Craven Cross shaft. The vein in the end is now 4 ft. wide, producing 20 cwt. of lead ore per fathom. As soon as the communication has been made the cost of tramming will be considerably reduced, and a large section of valuable ore ground laid open. Sinking below the 56 will be resumed on Feb. 1. The explorations in connection with No. 2 shaft are proceeding satisfactorily. The several points of operation are opening out favourably, and the indications generally are most encouraging.

ISABELLE GOLD AND SILVER MINING COMPANY.—The following is an extract from a letter received from the manager at the mines, bearing date Dec. 15:—"To-day Mr. Hawkins, the U.S.D. surveyor, is laying off my tunnel line with extreme accuracy. Yesterday I let a contract to build a bridge across the river, so that I might get the machinery to the tunnel mouth. After laying in supplies for the boarding-house, which are ordered, I will put men on to grade for the machinery and building (which last I will not spend much money on), and then break ground for the tunnel."

MINING COMPANIES REGISTERED IN 1878.—Mr. Ashmead, mining accountant, sends us his annual table of mining companies registered in 1878, which we shall publish in next week's Journal. Comparing the same with Mr. Ashmead's tables for the two preceding years, we find that in 1876 122 mining companies were registered, with a nominal capital of 6,012,400l., and in 1877 96 companies, with a nominal capital of 5,167,460l. In the past year 93 companies were registered, having a nominal capital of 4,223,000l. It must not be supposed that these amounts are available for mining purposes—many of the companies registered are the re-constitution of old concerns, and a large part of the capital issued goes in paid-up capital as purchase money to former shareholders or proprietors. It is pleasing to see that there is still much faith in British metalliferous mining, 32 companies being registered in 1878, against 23 in 1877. We observe that no metalliferous mine in 1878 was registered whose capital exceeded five figures. In one sense this is satisfactory, as in former days large capital too often meant large promotion money

money to vendors. The experience of the past in this respect is no doubt a useful lesson for the present. We heartily wish success to all who in these depressed times have the courage to work mines they believe to be good. Undoubtedly this country has more mineral wealth underground than all preceding generations have taken from it, and those who search will find.

DIVIDEND MINES OF 1878.—Mr. Ashmead, of 62, Cornhill, has his annual statistical table of the dividend mines of last year in preparation, but is waiting information from one or two pursers and secretaries. Will they forward the information asked of them to Mr. Ashmead on the forms sent them? The table will appear in our columns as soon as completed.

PLATINUM COATING OF METALS.

A practical demonstration of the important bearing upon the iron and metal industries of the United Kingdom of the discovery made some two years since by Mr. Jean Baptiste Dode, of Paris, is to be given this (Saturday) afternoon in the laboratories of Messrs. Johnson, Matthey, and Co., assayers to the Mint and Bank of England, so that the details of the patent by which the results are produced will not be uninteresting. The invention relates more particularly to the coating of articles of cast-iron, but is also applicable to the covering of other metals in order to preserve them from oxidation under the action of air, fire, or acid gases. The processes hitherto known for the coating of metals have only imperfectly attained the object in view, inasmuch as the coverings of copper, nickel, silver, or tin, applied by immersion or with the aid of galvanism, are not adapted to prevent oxidation. Mr. Dode's invention consists in the application of platinum in such a state of division as to enable it to be employed as a preservative against the oxidation of metals, whereby a considerable saving is effected, as compared with the systems at present in use, and much greater efficiency is obtained.

In carrying out the invention a composition is first employed consisting of about 22 lbs. of borate of lead and about 4½ lbs. of oxide of copper, the intimate mixture of which may be effected by means of an incorporator or other suitable machine, the necessary quantity of essence of turpentine being added to the constituents so as to render the product sufficiently liquid to be spread upon the articles to be coated. When the mixture is complete it is collected in a cast-iron vessel, and, say, about 1½ oz. of neat's-foot or other suitable oil added to it. The vessel is placed over a gentle fire in order to render the mass very fluid, and to obviate the necessity for adding a large quantity of essence of turpentine. When the mixture or composition is warm it may be thus employed. The article or surface to be coated is first cleaned by the removal of the loam or sand, if the article be of cast-iron, or of the dust or extraneous matters which may be attached thereto if articles of wrought or rolled iron are to be operated upon.

In order to effect the cleaning of the article or object a brush of hair is dipped into essence of turpentine, and the article or object is rubbed hard therewith, after which the article or object is permitted to stand for a short time in order to allow the composition to be partially evaporated; the prepared mixture or composition, which has been maintained at a gentle heat, is then applied. For this purpose the operator employs a large and somewhat hard brush, and the composition is applied to the article or object with a brushing and dabbing action, so as to draw the composition out of the brush, care being taken to lay on the coating of composition as evenly as possible.

The coating should be thin, its sole object being to prepare the metal upon which it is applied prior to receiving the platiniferous covering, and to prevent, in the case of cast-iron, the absorption of an excessive quantity of platinum. It is, therefore, advisable to make this coating thin, in order not to fill up the hollows or designs of the castings, which would detract from their merit. The articles or objects so treated are then placed in an oven or drying chamber, which is highly heated, so as to fix the composition, which by the action of the fire should become of a dark green colour. The articles are then allowed to cool, when they will be found ready to receive the coating of platinum, which is thus applied:—About 21 lbs. of borate of lead, and (say) about 11 lbs. of litharge are taken and mixed together, and reduced to a fine state of division, the mixture to be ground being damped with essence of lavender; the product is then collected by preference in a vessel of enamelled cast-iron, and allowed to stand for some hours.

The actual platinising is next effected by taking about 11 lbs. of platinum previously brought to the condition of dry chloride, upon which is poured (say) about 4½ lbs. of ether. The ether dissolves the chloride of platinum. As soon as the solution is effected about 34 lbs. of essence of lavender are added, care being taken to stir the mixture energetically with a spatula. When the mixture is complete the vessel is covered, and allowed to stand for (say) about 30 minutes; the vessel is then carried into the open air, and the cover removed so as to allow the ether to evaporate; the essence of lavender then remains in conjunction with the platinum. The platiniferous product thus obtained is poured slowly during agitation of the same into the mixture of borate of lead and litharge, and when this mixture is completed about 45 lbs. of amylic-alcohol are added; the whole is then mixed, and the platiniferous composition is ready for use. In order to effect the platinising of the article to be treated, it is simply necessary to take it when prepared as directed, and immerse it in the platiniferous compound; the article which will then be covered with a thin coating is allowed to dry. When the immersed article has been coated with the material should any large hollows exist in the casting care is to be taken to remove with a brush the excess which might produce a prejudicial effect. The articles are then placed in a drying chamber, care being taken not to raise the temperature to so high a degree as for the preliminary drying operation previously mentioned, after which they are allowed to cool, when they will present to the eye a beautiful silvery white appearance. By applying the platiniferous composition either with the brush or by immersion to articles or objects of cast-iron covered with enamel similar results may be obtained. Although Mr. Dode has only mentioned the essential oil of lavender, it must be understood that he has given it as a type of those essential oils which may be employed either as substitutes for the same or in conjunction therewith.

THE MINING INDUSTRY OF GERMANY.—A report has been issued showing the condition of the mining industry in the Kingdom of Prussia during the year 1877. The season of serious depression had then already begun, and affected Prussia and Germany as much as any other country. Nevertheless there is a decrease observable, on the whole, only in the money value of the output and the produce of mineral works, the quantity having not inconsiderably increased. A more satisfactory feature by far is, according to a review of the mining industry published in the Cologne Gazette, which appears in this one respect to reach down to the present time, that no distress worthy of the name has been occasioned among the workmen by the reduction of prices. The workmen have earned less, they have had to work more, many have had to seek work elsewhere, making roads and railways, their wages have been reduced, and the prices of the necessities of life have not become cheaper in the same proportion; nevertheless, by dint of thrift, and economy, and careful husbanding of their means, the workmen have kept their heads well above water—nay, they have even assisted their employers in turning their own labour to better account, so as to make up the bad prices by economy of labour. In 1867, one man employed in mining industries used about 4090 cwt. of coal; in 1873 his work had so far increased as to require 4137 cwt.; in 1876 it required 4338, and in 1877 as much as 4615 cwt. of coal.

The output of iron ore in 1877 exceeds by more than 3,500,000 cwt. that is, 7 per cent.—the output of 1876, notwithstanding the number of mines worked was 107 less, 175 others having stopped work already in the previous year. The market value of 1 cwt. of ore was only 31-5 marks (or shilling-), as compared with 33-7 marks in 1876, and 37-2 marks in 1875. In the same manner a larger quantity of pig-iron was turned out than in 1876, though also at a lower price. The difference in the quantity amounted to 7-3 per cent., or

about two millions of cwt. The quantity turned out was 28,433,341 cwt., produced in 162 works; and it was exceeded previously only in one year, 1872, when 29,156,704 cwt. were turned out from 253 works. The price of 1 cwt. of pig-iron was in 1869 3-72 marks, in 1872 5-92 marks, but in 1877 only 3-08 marks. The quantity of finished iron and steel produced in 1877 was about equal to the produce of the years 1872, 1873, and 1876, but in respect of price there was a considerable falling off. In 1869 18,363,550 cwt. realised more money by 14,000,000 marks than did 25,200,000 cwt. in 1877. The output of coal was less in 1877 than in 1876 by 16,000,000 cwt., having reached the figure of 673,440,492 cwt. But then, 1876 was an exceptionally busy year, the output exceeding that of 1875 by 21,000,000 cwt., and that of 1874 by as much as 50,000,000 cwt. With the only exception of 1876, the output of 1877 was larger than in any year since 1867. As regards price, 1 cwt. fetched 27-9 marks in 1867, 54-7 marks in 1874, and 27-7 marks in 1877. The copper industry is the only mining industry beneficially affected both as regards price and output in the year 1877. The trade flourished to such an extent as to admit of the employment of 3153 additional hands, the entire number of workmen employed in this industry being about 38,000.

IVORY GLASS.—An admirable opaline glass, which closely approximates ivory in appearance, is being manufactured by Mr. J. G. Sowerby, of Gateshead. It has hitherto been customary, in endeavouring to produce this colour, to add to the usual ingredient of common flint glass, arsenic to make the glass opaque, and uranium to give it the yellow tint. He obtains a much finer body than can be obtained by this combination—in fact, a china body, by dispensing with the arsenic and substituting cryolite spar. His combination of cryolite and uranium may be added to any ordinary batch for flint glass, and he finds a batch thus composed answers very well:—Sand, 12 cwt.; 58 per cent. soda, 1 cwt.; baryta (carb.), 1 cwt. 1 qr.; nitrate of soda, 1 cwt. 1 qr.; and manganese, 14 lbs. To every 12 cwt. of this batch he adds 24 lbs. of uranium, and 1 cwt. 3 qrs. 8 lbs. of cryolite, and operates as in making ordinary flint glass. He is aware that cryolite is largely used in glass making, but not in conjunction with uranium or for the object of this invention.

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		LEAD ORES.			
Date.	Mines.	Tons.	Price per ton.	Purchasers.	
Jan. 8	Tankerville	85	£ 9 15 0	G. Barr.	
	ditto	15	£ 7 6	ditto	
	—Rookhope	40	£ 15 0	J. Dinning.	
Jan. 9	—South Darren	20	14 7 6	Sheldon, Bush, and Co.	
	—Talaroch:				
	Maeseyredda	45	9 17 6	Walker, Parker, & Co.	
	Coetia Lily	17½	9 18 6	ditto	
	ditto	17½	9 18 6	Adam Epton.	
	—Rhydalun	50	9 15 6	Walker, Parker, & Co.	
	—Van	150	10 4 0	ditto	
	—ditto	50	10 7 0	Weston, Son, and Co.	
	—ditto	50	10 5 0	ditto	
	—ditto	50	10 5 0	Mining Co. of Ireland.	

		BLENDE.			
Date.	Mines.	Tons.	Price per ton.	Purchasers.	
Jan. 8	Talaroch	100	£ 3 0 0	Swansea Vale Co.	
	— ditto	100	£ 2 15 0	Richardson and Co.	

Notices to Correspondents.

* * * Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be filed on receipt; it then forms an accumulating useful work of reference.

SIR.—Why is it that Wheel Peavor, with its rich lodes, is only quoted at 6 to 6½ (7½ 11s. paid), whilst East Pool, Wheel Prussia, and South Cundorow are all at high premiums, and not paying higher dividends? I ask this as I thought of taking shares in this mine, and from no gambling intentions. From experience I find it useless to ask a mine broker, as he is sure to answer as it suits his interests.—SHAREHOLDER.

SIR.—I am a Colorado Shareholder, and I look upon the fact you do not refer to this mine as you used to do as ominous. No information of any kind is vouchsafed by the office, and I am thoroughly in the dark as to whether they are working at a profit or loss. What I make out from the gloomy reports is that the mine has rich but small veins, very likely shallow, and produces under 50 tons a month. I suppose some attempt will be made to follow the veins already discovered to the tunnel to see what they lead to? If the formation is granite I am afraid the mine will not prove an heirloom. Could any report be more unsatisfactory than Mr. Rosewarne's? If that is the report of a miner of 40 years experience sends me, what are we to expect from our Cornish captain? It is another proof of the folly of sending a Cornishman to inspect an American silver mine. Nearly every gold or silver mine captured by Cornishmen is in difficulties. Directly the lode is lost they lose their heads and drive at random. Could any mine be better than Potosi, and yet with difficulty it turns out 400 ozs. per month? In American hands it would treble the output. Out of their country Cornishmen are bad geologists.—SHAREHOLDER.

MINING IN IRELAND.—As to mining matters in this country, they are at a very low ebb. The price of metals has struck a serious blow to most of our mining industries, and the illiberality of landlords or their agents is just as serious an obstacle. In two cases within a short period I applied for permission to make searches, asking for a two years' lease, subject to having a lease at the expiration of that time on certain specific conditions, and the answer in each case was that they would give me leave to make searches for the two years. But they would then fix the royalty when they could see what was to be got. These two gentlemen were the agents of English landlords. In another case in which I was interested an Irish nobleman refused to renew a lease of a property, where an immense sum of money had been laid out, unless a lease was accepted with covenants which would render the whole property valueless to the company; and besides this, the worthy lord wanted a fine of 10,000, which he afterwards moderated to 7500. The consequence is the mine is abandoned, and machinery and materials sold off for about 5% per cent. of what it cost. There is a mine (silver-lead) within 6 miles of my residence, which has from surface operations only sold for upwards of 60,000 worth of ore. The parties to whom it belonged sold it a short time since to a person who cannot now work it, and although there is 60000 worth of machinery on it, I am authorised to sell the whole property for 30000, with a lease for ore and no royalties, and within ½ mile of a railway with three trains a day. I think this proves what I started with, that mining here is at a low ebb.—ERIN.

RECEIVE.—A Shareholder (New Zealand Kanapa): We will enquire into the matter, as we think there must be some mistake.—T. H. N. (M. E. R.): "J. B." (Paris): "E. H." (F. G.): "S. B. M." (Manchester): "One of Your Readers": The statement is partially true.—Shareholder (Wheal Grenville): "Constant Reader" (Norwich): "N. W." (Truro): Yes.—F. K. (Runcorn): "T. W." (Manchester).

IMPORTANT NOTICE.—REDUCTION OF POSTAGE ON THE "MINING JOURNAL."—In consequence of the new POSTAL CONVENTION, which came into operation on July 1, the postage of the Mining Journal to many countries will be reduced to one fourth. Henceforth the subscription will be 10s. 4d. per annum (39 frs.), postage included, for the following countries. The amount will, if desired, be collected at the subscriber's residence at the end of each year. The subscription continues until countermanded:—Austria, France, Belgium, Denmark (including Iceland and the Faroe Islands), Egypt, Germany, Gibraltar, Greece, Heligoland, Italy, Luxembourg, Netherlands, Norway, Portugal (including Madeira and the Azores), Roumania, Russia, Serbia, Sweden, Switzerland, United States, Malta, Turkey, Morocco, Tunis, and the Canary Islands. Spain 12. 10s. (50 frs.).

THE MINING JOURNAL.

Railway and Commercial Gazette.

LONDON, JANUARY 11, 1879.

LINCOLNSHIRE IRONSTONE AND IRON.

From the returns already received it is evident the quantity of iron ore raised throughout the kingdom in 1878 will fall considerably short of the production even of the previous year. To some extent this may be attributed to the falling off in the make of ordinary pig, and also to the large quantity of foreign hematite ore which is imported, in consequence of the increasing demand which has grown up for Bessemer steel, but which cannot as yet be produced from the Cleveland and other argillaceous ores, although no doubt in time even that change will be effected, for according to Mr. I. LOWTHIAN BELL and others the eliminating of the phosphorus and sulphur from it, which is all that is required, has been all but accomplished. The decline in the output of ore, however, has not been confined to any district in particular, but has been general, for it has been felt in the most recently discovered of our ironstone fields—Lincolnshire. The part of that county where iron is made and ironstone worked has been a *terra incognita* to correspondents and newspaper writers, for the representative of the Mining Journal appears to have been about the only person who has visited the out-of-the-way district to note what is going on in it from time to time. This is all the more surprising seeing that North Lincolnshire promises to become one of the most important mining districts in the kingdom, for its growth has been almost as rapid as Cleveland, whilst Frodingham, the village occupying the central position, with its reading room, public hall, and other buildings, is fast assuming a town-like aspect, and bids fair to become a second Middlesbrough, for which it has all the necessary surrounding elements. To that end a great deal has been done by the owner of the estate on which the ironstone is raised and the furnaces erected.—Mr. R. WINN, M.P.—and who has been ably seconded by his energetic agent and engineer, Mr. J. ROSEBY, of Haverholme House. Looking, however, at the business done, as before stated, the exports of stone were not quite so large as usual, owing to the many blast furnaces which have been out in Staffordshire and other districts, where a great deal of the Lincolnshire stone has been used. A good deal, however, has been raised by the Messrs. DAWES, who indeed were the first persons that ever smelted it, their connection with the district dating so far back as 1861, when they commenced a railway from the Trent to the field of ironstone to a wharf on that river so as to send it to their works in Yorkshire, where it has ever since been used in connection with the local ore, and has been found to answer well for both forge and foundry purposes. The Staveley Company some time since recognised the value of the stone, and raised a tolerably large quantity during the past year for their own works, which are about the largest in Derbyshire. The ore has also been extensively worked by the Parkgate Company, near Rotherham, well known for the production of both heavy and light plates, and by Messrs. COOKE and CO., Tinsley, near Sheffield. A considerable tonnage has been sent into several districts by one of the principal iron merchants connected with the locality.—Mr. W. ROSEBY—who is the managing director of the Appleby Company, who have two furnaces in the Frodingham district. Mr. W. ROSEBY has also been instrumental in opening out a fine field of ironstone near to the City of Lincoln, where the work is being carried on by ordinary mining, some of the stone giving a high percentage of iron, and being comparatively free from sulphur or phosphorus; but of this more hereafter.

The local consumption has been well maintained, and towards the close of the year increased more than otherwise. There is, however, every probability that the present year will see a change for the better both as regards the local and foreign requirements, for there can be no doubt but what the iron trade has reached its worst. The stone, too, has certain advantages that will adapt it for mixing with other ores, but worked by itself the advantage, unless great care in selection is taken, would be just the reverse. In the Frodingham district a great deal of lime is found along with the stone, even to the extent of being in excess of what is required for smelting. This is certainly an advantage, where it is used with ore of a more silicious character, but in using by itself great care has to be taken in the selection of the stone. The difficulty at times has been so great that even at Frodingham it has been found necessary to have stone from a distance to mix with that raised in the locality. But still by itself if the stone is properly selected, for it varies considerably, a very good quality of pig can be produced, and has been

found well adapted for the making of sheets, plates, wire, as well as for all ordinary foundry purposes. It is of a very fluid character, is well suited in consequence for mixing with the Cleveland, and so mixed has been used instead of Scotch. The stone from the Lincoln mines is much richer in metallic iron, and when mixed with the Frodingham not only corrects any excess of lime in the former, but produces an excellent quality of iron. The two sorts have been successfully used by the Appleby Company in particular, and some shown us by Mr. W. ROSEBY were remarkably good in both grain and colour, and evidently suitable for almost any purpose for which ordinary iron is used. The depth of the bed varies considerably, in some places being upwards of 18 ft. thick, and as the royalty is a very moderate one indeed, it no doubt with the revival of trade will be found a sufficient inducement to capitalists to operate in a field where iron-making can be conducted more economically and at a less cost than probably in any other district in England.

The early history of mining in Lincolnshire is by no means an uninteresting one. As in Cleveland, we believe the discovery of the ore was accidental, but it had the effect of transforming a vast tract of swampy and unprofitable land into a comparative El Dorado, finding profitable employment for a large number of workmen, and laying the foundation of a thriving industrial community that bids fair to become the rival of Cleveland and Middlesbrough in mineral wealth and population. On the first discovery of the ore the task of finding a market for it devolved upon Mr. JOHN ROSEBY, who was then, as now, well known as an engineer and geologist, and he found that to get ironmasters to even make a trial of it was no easy matter. The appearance of the ore itself was certainly anything but captivating, bearing a strong resemblance to the Northamptonshire, which took many years before its value was recognised by ironmasters. There was also the disadvantage of no direct railway communication with other ironmaking centres. After many difficulties Mr. GEORGE DAWES was induced to try the ore in one of the Yorkshire furnaces, and the trial was so far satisfactory that the Messrs. DAWES took a lease from Mr. WINN of a considerable area of the minerals at Frodingham. The progress made in developing the ore was slow at first, but in 1865 a change for the better took place, and from that time up to the present the progress made has been rapid, and Lincolnshire ironstone is now well known in Staffordshire, Derbyshire, the West Riding of Yorkshire, and Cleveland, as well as in many other parts of England, and thousands of tons are sent away monthly, there being now a branch line of the Manchester, Sheffield, and Lincolnshire Railway, which affords direct communication to all parts of England, as well as to the shipping ports of Grimsby and Hull. After the stone had been tried at Elsecar by the Messrs. DAWES, that firm determined to erect some furnaces at Frodingham, and in a few years afterwards that firm was followed by others, and thus was laid the foundation of the present extensive ironmaking district of North Lincolnshire, which, for the production of ironstone alone, now holds the fifth position amongst the counties of England and of South Wales in which iron ore is raised. The progress made since the opening out of the ore at Frodingham will be seen from the following figures showing the tonnage produced in each year:—

1850	...	Tons	2 000	1869	...	Tons	220,524
1860	...	...	16,192	1870	...	...	216,829
1861	...	...	32,709	1871	...	...	217,769
1862	...	...	50,323	1872	...	...	256,149
1863	...	...	69,618	1873	...	...	350,281
1864	...	...	74,619	1874	...	...	463,239
1865	...	...	124,938	1875	...	...	626,627
1866	...	...	175,724	1876	...	...	573,374
1867	...	...	192,213	1877	...	...	508,749
1868	...	...	200,690	1878	...	Estimated	520,000

It may, however, be stated that in different parts of Lincolnshire there is a very large area of mineralised ground as yet untouched, but the actual productive power of the Frodingham district has not yet been tested, and no doubt twice the present quantity could be raised in it for a long series of years to come. The stone varies a good deal in richness, for whilst that at Frodingham gives from 27 to 32 per cent. of metallic iron, that at Lincoln, worked by the Mid-Lincoln Iron Company, of which Mr. ROSEBY is the chief, yields in some instances 50 per cent. and upwards.

As to the furnaces, as before stated, the Messrs. DAWES commenced the first one in 1862, and have now seven, three of them having been in blast during the present year. Following that firm, the Messrs. CLIFF (the Frodingham Iron Company) commenced the erection of furnaces in 1866, and for a long time had two constantly going, but in 1875 we believe they built two more, but of the four only two have been in blast for some time past. Mr. DANIEL ADAMSON, the well-known boiler maker, of Hyde, near Manchester, was the next to patronise the district. Ultimately three other furnaces were added, and the establishment is now known as the North Lincolnshire Iron Company's works. Again, in 1872, the Lincolnshire Smelting Company commenced two furnaces, and were followed by the Redbourne Hill and the Appleby Company, so that there are now 21 furnaces within a short distance of each other. The depressed state of trade, however, during the last year was such that until April only nine were in blast. In that month, however, the Lincolnshire Smelting Company put one of their furnaces in blast, and later on in the year the second one, both being set in operation by Mr. J. ROSEBY, one of the directors. The furnaces in blast during the year will have been as follows:—

	In.	Out.	Total.
Appleby	2	0	2
Frodingham Iron Company	2	2	4
North Lincolnshire Iron Company	2	2	4
Redbourne Hill Iron Company	0	2	2
Lincolnshire Iron Smelting Co.	1	1	2
The Trent Ironworks (Dawes)	3	4	7
Total	10	11	21

When smelting was commenced by the different companies considerable difficulties were met with, owing to the peculiar nature of the stone, so that heavy losses were sustained. This appears to have been the result of smelting stone all of one character as found close to the furnaces, but when the soft ore was mixed with silicious stone found near Lincoln the difficulties disappeared, and the iron was made to pay. The Lincolnshire Iron Company lost a good deal of money, but Mr. WINN met the directors in a very liberal spirit, making an abatement in the royalty, and so allowing of operations being resumed in the early part of last year.

Mr. ADAMSON, who was amongst the first to try the Lincolnshire stone, and built the largest furnace at Frodingham, which at first was anything but profitable, now speaks more highly of the stone. He says that if the stone were worked simply as an ironstone, and the limestone thrown out purely as a limestone, the Lincolnshire iron field would be able to hold its own under almost any circumstances and conditions of trade that might arise in this country, and some of the more favoured and less variable mineral districts, taking Cleveland for instance, would not certainly be able to produce a ton of iron more cheaply than it could be made in Lincolnshire if that proper and moderately careful selection was adopted instead of one of random and recklessness, where the value and character of the material was not taken into account. The experience gained in North Lincolnshire shows that ore containing a large quantity of lime must have a certain quantity of silica and alumina introduced for fusing at the ordinary temperature of a blast furnace. We are, however, told by Mr. DOVE, the manager of the Redbourne Hill Company, who has given a good deal of attention to the nature and variable properties of the Lincolnshire ore, that when the lime in the charge is greater than what is absolutely required as a flux the iron resulting is singularly deficient in sulphur and silicon, while with the lime below the amount required the proportion of these two elements is at once increased at the expense of quality. But that both these extremes can be avoided is satisfactorily proved by the fact that the stone has been for years and is now being smelted without any admixture of other stone or fluxing material whatever. We think that we have shown that the Lincolnshire iron field is a most important one, and, considering the vast area of mineral ground, that there is a great future before it does not admit of a doubt. As to

the progress made in the production of iron the following figures will show:—

1866	...	Tons	13,765	1873	...	Tons	52,076
1867	...	...	25,579	1874	...	...	67,260
1868	...	...	33,999	1875	...	...	110,000
1869	...	...	33,786	1876	...	...	125,198
1870	...	...	31,690	1877	...	...	116,857
1871	...	...	30,122	1878	...	Estimated	112,000
1872	...	...	36,989				

In conclusion, it may be stated that at one time a good deal of the coke used was imported from Durham, but during the last year or two the colliery owners in South Yorkshire have turned out a quantity of coke equal to the former, which is now being largely taken by the ironmasters of Lincolnshire, the two districts being within a comparatively easy distance of each other, so that there is a considerable saving effected in the railway rate alone.

THE HISTORY OF THE STEAM-ENGINE.

Steam power has now become so much of a necessity that one can hardly picture to himself the time when the steam-engine was unknown, and when even the very nature of steam was misunderstood, yet it is only since about 1700 that the desirability of a piston was appreciated, and it was some years later that the idea of packing the piston presented itself to those concerned. The history of the various inventions which have from time to time been introduced in connection with the use of steam is obtainable in a concise and systematic form in the Abridgements of Specifications relating to the Steam-Engine, published by the Government Commissioners of Patents, and the series is rendered particularly interesting by the historical notices inserted by way of introduction. Learned men, it is remarked, have pointed out the cursory observation of ARISTOTLE that "water will rise in a heated vessel" as the first notice in an ancient author of an effect arising from the condensable property of steam, and incidentally of the eolipile that has been designated the steam-engine of antiquity. Two centuries after this period HERO, an Egyptian philosopher, collected, A.D. 150, accounts of contrivances in which motion was produced by means of heat and "air." HERO also describes a boiler in which a blast of hot air and steam is blown into the fire, and in which the cold water does not mix with the hot until it passes to the bottom of the vessel, while water extremely hot flows from the spout. The brass eolipiles, says VITRUVIUS, the Roman architect, are hollow, and have a very narrow aperture, at which they are filled with water and placed upon a fire. Before becoming hot they emit no vapour, but as soon as the water begins to boil they send forth a vehement blast. "From this easy experiment," he says, "we are able to judge of the cause of the mighty winds of heaven; the eolipile makes it evident that they arise from the action of heat and moisture."

And it was not alone for the purpose of scientific investigation that the eolipile was turned to account; it was also made useful by priests to keep their congregations in subjection. On the banks of the Weser, says ARAGO, the god of the Teutones of old sometimes showed himself unpropitious by a sort of thunderclap, succeeded by a cloud which filled the sacred enclosure. The statue of the god discovered, it is said, in excavations, clearly shows the method by which the miracle was accomplished. The god was of metal, and its head was hollow, and contained an amphora (nine gallons) of water. Wooden plugs closed up the mouth and another opening above the forehead. Lives coals dexterously placed in a cavity of the skull gradually heated the water. Very soon the generated steam forced out the plugs with a loud report, and escaped with violence in two streams, and raised a thick cloud between the deity and his stupid worshippers. Further traces of the agent is lost until the time of JUSTITIAN, when ANTHEMIUS, architect to the emperor, used it to frighten his neighbour, ZENO the orator, who had offended him. In a church at Rheims, A.D. 963, GERBERT, a professor in the schools, constructed an "hydraulic organ," in which air escaping in a surprising manner by the force of heated air filled the cavity of the instrument; and the brazen figures emitted musical sounds through multifarious apertures. In 1568 BRESSON, of Orleans, made some experiments to determine the bulk of steam raised from a measure of water, but without success. In 1601 BATTISTA PORTA, and in 1606 JUAN ESCRIBANO, who translated PORTA's book into Italian, also sought to ascertain the quantity of water in a certain quantity of steam, but the fact sought to be established was left as doubtful as before.

But the extent of its expensibility was unknown until MARIN BOURGEOISE, a native of Lisieux, in Normandy, a man of superlative ingenuity, made experiments before LOUIS XIII. to employ steam instead of gunpowder in artillery. This was previous to 1600. At this date RIVAUD, proceeding as a volunteer against the Turks who were besieging Comorn, heard of the invention, but did not comprehend its mode of operation. On his return to France in 1606 he saw the "harquebuse a feu," and described it in "Les Elements d'Artillerie," which he printed in 1608. He announced the invention in the form of a problem—"How a cannon might be fired with pure water." A gun of the common form was firmly closed at the touch hole, and the chamber filled with water; a bullet was inserted and kept in its place by a pole, a fire was then made under the trunnions, and when the water was raised to a great heat the pole which kept the charge in its place was withdrawn, and the expansion of the vapour expelled the ball with great violence. From observations found in other parts of his treatise it may be inferred with some certainty that RIVAUD had himself made experiments with steam of high pressure. He describes and gives a drawing of an air-gun also invented by BOURGEOISE.

Perhaps the earliest practical application of the power of steam was by the Marquis of WORCESTER, who, amongst other things, discovered "an admirable and most forcible way to drive up water by fire; not by drawing or sucking it upwards, for that must be, as ye philosopher calleth it, *infra sphaerum activitatis*, which is but at such a distance, but this hath no bounder if ye vessels be strong enough, for I have taken a peece of a whole cannon whereof the end was burst, and fill'd it three-quarters full, stopping and screwing up that broken end, as also ye touch hole, and making a constant fyre under it; within 24 hours it burst and made a great crack, soe that having found a way to make my vessels soe that they are strengthened by the fyre within them, and ye oe to fill after ye other I have seen ye water run like a constant fountaine streams 40 fote high. One vessel of water rarified by fyre driving 40 of cold water, and a man that tends the work is butt to turne two cocks that one vessel being consumed another begins to fyre, and that to refill with cold water; and soe successively ye fyre being kindled and kept constant wch the self-same person, may likewise abundantly performe in ye interim between ye turning off ye said cocks." The exact and true definition of the Marquis's engine patented 1663 is very curious, it "consisteth of the following particulars:—1. A perfect countervail for what quantity soever of water.—2. A perfect countervail for what height soever it is to be brought into.—3. A primum mobile commanding both height and quantity regulariter-wise.—4. A viceregent or countervail supplying the place and performing the full force of a man, wind, beast, or mill.—5. A helm or stern with bitt and reins, wherewith any child may guide, order, and control the whole operation.—6. A particular magazine for water according to the intended quantity or height of water.—7. An aquaduct capable of any intended quantity or height of water.—8. A place for the original fountain or even river to run into, and naturally of its own accord incorporates itself with the rising water at the very bottom of the said aquaduct, though never so big or high. By Divine Providence and heavenly inspiration this is my stupendous water commanding engine, boundless for height and quantity." A large scale machine appears to have been at work at Vauxhall in May, 1669, and was there inspected by the GRAND DUKE OF TUSCANY, who was then on a visit to CHARLES II.

But the real commencement of modern steam-engine development may be dated from BOYLE's announcement in 1678 that "the elastic power of the steam seems manifestly due to the heat that expands and agitates the aqueous particles whereof steam consists," and he considered these were alone condensable, and that the air was irreducible to a fluid. Mr. BOYLE's observation explained a

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fact which has baffled previous experimenters to account for, and which may be said to have laid the foundation of the condensing-engine. It appears that so long since as 1683 Mr. ROBERT FITZGERALD and four other gentlemen had a patent to render salt and brackish water sweet and fit for drinking and washing by boiling the water and condensing the steam; the attention attracted by this process within the last few years is well known. The researches of Dr. PAPIN greatly facilitated further progress, and in 1698 SAVERY patented his water-raising engine, but his earlier efforts were far from successful. In 1706 SAVERY set one of his engines down in the liberty of Wednesbury, near a place called then the Broadwaters, but which is now dry land again. The engine, says SHAW, could not be brought to perfection, as the old pond of water was very great, and the springs many and copious that kept up the body of it, and the steam when very strong tore the engine all to pieces. The invention of the atmospheric or lever engine by THOMAS NEWCOMEN, a blacksmith, and JOHN COWLEY, a glazier, both of Dartmouth, Devon, was made as early, it is said, as that of SAVERY, though not exhibited in a working form until 1710. The engine used near Walsall in 1712 had no working gear, and the cocks were opened and shut by hand, but in 1713 HUMPHRY POTTER, a boy who attended the engine to open the cocks, "attached a catch and strings in such a manner to the cocks and lever that the cocks were opened and shut by the rise and fall of the beam." The contrivance made the engine self-acting.

From the beginning of the 18th century the progress made has been marvellous, and any particular branch of improvement would form the subject of a volume, but from the collection of Abridgements all necessary particulars may be gained. Even the short abstracts given fill about 3000 pages, but as the publication is by the Commissioners, and issued at cost price, the whole series is obtainable for less than 15s., and for educational establishments generally a more useful and interesting collection could scarcely be found. They would form three handsome volumes, and would make an appropriate present for the library at the present season.

LABOUR AND CAPITAL.

The darkest hour is before the dawn, and it is very possible that the terrible cloud which now hangs over the trade, commerce, and industry of the country may prove to have a silver lining. The affairs of Great Britain, like the affairs of Mr. MICAWBER, appear to be coming to a crisis. The remedies which are being applied are becoming sharper and sharper, and it may be hoped that the cure will be effectual and complete. We say that the remedies which are being applied are becoming sharper and sharper, because wages are being reduced in all directions, and with more and more severity and success. As we have before remarked, there is nothing to exult at in this; but, in the interest of the working classes themselves it is necessary that the wages paid for labour should be such as will leave some remuneration for the capital which feeds and animates the whole social system. Wages must also be brought down to a point at which industrialists will be enabled to sustain and face without loss the competition of foreign countries. These are the two conditions upon which the future industrial existence of the country may be said to depend. The fact is being increasingly recognised, and in obedience to an utterly irresistible combination of circumstances the means of a cheaper production are being gradually secured. This result is, however, being attained inch by inch, and in spite of every conceivable impediment and obstacle; in fact, the utter disregard which the working classes, upon the whole, exhibit of the interests of their employers is one of the gravest features of the times. A working class mindful only of present enjoyment, improvident and reckless as regards the future, and apparently utterly ignorant of the most elementary principles of political economy, must ever be a source of social danger and industrial weakness.

Our daily contemporaries have perhaps unconsciously, but none the less actually, rendered a service of very great importance to the country by publishing in each impression more or less detailed particulars of the distress which has overtaken the working classes. We say the daily journals have in doing this deserved well of their country, because they have thoroughly roused public attention to the gravity of the crisis, and have probably taught some few of the working classes themselves that the interests of labour and capital are not, after all, antagonistic, but are in reality identical, and that what prejudices capital must in the end also be injurious to labour. It is rather curious to find a journal of the deserved authority of the Daily News enforcing principles upon which we have insisted long months since in these columns—that labour must submit to an inevitable reduction of wages, and that our upper classes, so called, must return to the thrift, the simplicity, and the industry of their ancestors. Sweet and salutary are, after all, the uses of adversity. If our working classes have during the last ten years become even more reckless and improvident than they formerly were, it is none the less true that their employers have also become more luxurious, and more than ever slaves of the miserable phantom called "society." "Society" expects somehow to live luxuriously without work, and hence our modern young gentlemen and our modern young ladies have a contempt for honest toil.

The time has come when all this wretched rubbish must be cast to the winds, and we must revert to the patient industry and the sober enterprise of our ancestors. Talk of the march of modern civilisation, indeed! Why, to what a pass has it brought us, or rather reduced us? We have a working class intent on coarse immediate enjoyment, an upper class expecting to live somehow without industry, and a number—a far too large number—of commercial men who appear ready to resort to any shift or subterfuge, however base and fraudulent, for the purpose of staying off some pressing difficulty of the moment.

GOLD IN VENEZUELA.—Messrs. Kühner, Hendschel, and Co. send the following extract from a letter received from their correspondent at La Pastora:—"The mines almost every day show a fabulous increase, especially the new one of La Pastora. The nuggets we send you are taken from the soil almost pure, at a depth of about 3 ft. I send them in exactly the same state as extracted from the soil. During the last month about 1500 ozs. have been received." They add that they have just received 234 ozs. from this mine, consisting chiefly of nuggets of an unusual size.

GOLD IN AUSTRALIA.—From Melbourne (Nov. 28) we learn that affairs relating to gold mining are unchanged. The introduction by the Government of diamond drills, for testing at great depth the auriferous nature of the country, has been productive of good results.

A NEW PATENT WHEEL.—During the last two or three years a good deal of attention has been paid to the manufacture of wheels for locomotives, trucks, colliery cars, and vehicles for ordinary travelling, and the result is that marked improvements have been made not only in their construction but of the material of which they are composed. But it is not easy to get some persons out of the old grooves, so that wooden wheels are still extensively used, although they are far more expensive than those made of iron or steel, more particularly of the latter. The latest improvement introduced is an invention just patented by Mr. W. ARNOLD, of the Victoria Works, Barnsley, who has produced a wheel which runs smoothly, being entirely free from oscillation, cannot be easily damaged or affected by the weather, will last for a great length of time without requiring repairs, and can be produced at a moderate cost. The nave is neatly constructed, the inner part being fitted with wood, which has the advantage of allowing for the introduction and fixing of any description of bosh and axle now in use. The spokes are forged hollow or tubular, and notwithstanding their apparent lightness they are fully equal to any weight or strain which they may be subjected to. The felloes are also made hollow, light, and in appearance almost every way resemble the ordinary wooden stock. With respect to ordinary wooden wheels it may be said they frequently get out of repair, owing to exposure to the weather, and the continuous oscillation which they are subjected to in working, so that they are constantly costing money from the in-

juries they receive until they are replaced by new ones, when after a time the same process goes on. All these annoyances are obviated by the wheel of Mr. Arnold, which with its many advantages cannot well fail to meet with a good deal of support if only for its great durability, non-liability to damage, and economy of construction, which are essential now-a-days in connection with every description of machinery for locomotion and other appliances.

REPORT FROM CORNWALL.

Jan. 9.—Cornwall has one absorbing topic of conversation this week, and that a most unfortunate and unhappy one—the sudden stoppage, spreading wide disaster, of the Cornish Bank of Messrs. Tweedy, Williams, and Co. It is not long since this bank was regarded in the county, especially in West Cornwall, as no way inferior in character, and certainly far better known, than the Bank of England; indeed, many of the general population would of the two rather have preferred one of "Tweedy's notes" as expressing what to them, from its local connections, seemed somewhat more tangible. That such a bank, with a history of more than a century, and with ramifications extending into every department of local trade and enterprise, should fail is a disaster in presence of which all previous ones of the kind—the stoppage of the St. Columb Bank, and more recently of one at Helston—sink into insignificance. There had been rumours afloat, but they had obtained comparatively little credence, and when on Saturday morning the fatal notice—"This bank is stopped"—appeared on the doors of the head bank at Truro and on those of the branches at Falmouth, Redruth, and Penryn, dire was the consternation. Moreover, the effects reach far beyond the immediate circle of depositors, for the current note issue of the bank exceeded 20,000*l.*, and it is as yet quite an open question what these securities are worth. The whole of the books and papers of the bank are now in the hands of a firm of accountants, who are preparing a statement of its affairs to be submitted to the creditors at as early a date as possible, and pending the presentation of that report it is utterly impossible to say how matters do stand, though the liabilities have been semi-officially stated at 685,000*l.* It has been asserted, and on what claims to be good authority, that the assets will pay 20s. in *l.*, but, on the other hand, this is regarded as exceedingly doubtful by all except the most sanguine. The bank was a favourite one with depositors, especially with Cornishmen abroad, and their claims, apart from the ordinary commercial relations, may be very large. Moreover, it is very well known that there are, especially at and around Truro, a number of overdrawn accounts, the existence of which in many cases will, it is feared, ere long reveal themselves in bankruptcies. Messrs. Tweedy and Co. were not considered to carry on a risky business, but they were known to be accommodating, and in Truro, too, where party politics run high, the weight of the bank, it is said, was thrown heavily into the Conservative scale, and this, too, if true—but it is denied—would have some effect upon its transactions.

The cause of the stoppage is to be found in the death of Sir Frederick Martin Williams, the only partner in the bank outside the Tweedy family—Mr. Robert Tweedy, chairman of the Cornwall Railway, and his three sons. Sir Frederick inherited his interest in the bank from his father, Sir William Williams, who was understood to have left him property considerably exceeding half a million. Not long since, too, when Sir Frederick's will was proved, in addition to his large freehold estates, entailed and otherwise, his personalty was sworn under 100,000*l.* The substantiality of all this is now, however, being called in question, and there are some very singular rumours current, not only about the actual position of Sir Frederick's affairs, but about his death, which it will be recollected took place suddenly, and at the inquest was ascribed to apoplexy. That Sir Frederick was heavily involved at least now appears certain. An unfortunate circular issued by Messrs. Tweedy, and which did more to shake confidence than anything else, stated that arrangements were being made to replace Sir Frederick's one-third share of the capital, and that the bank would be materially strengthened by the money which would be received in consequence of his death. From a business point of view there is of course only one way of interpreting the latter statement. Although as yet officially unexplained, it evidently has a wider meaning than the mere replacement of capital, and refers to an indebtedness to the bank. One is not, therefore, surprised to hear on very good authority that Sir Frederick's account was considerably overdrawn, the extent being placed at so high a sum, indeed, as 80,000*l.* Whether that be so or not, it is quite clear the amount must be large.

Concerning the prospects of recovery out of Sir Frederick's estate, there are very diverse statements; on the face of it, and even apart from the statements of the will, these should be good. The entailed estates, which are valued at not far short of 250,000*l.*, are, of course, not liable; but then, in addition to the bank, Sir Frederick was a partner in the tin-smelting firm of Williams, Harvey, and Co., in the Perran Foundry, and in the Perran, Portreath, and other companies. He was largely interested in mines, and in addition to holding other landed unentailed property, his life is understood to have been insured for 80,000*l.* But while on the one hand it is stated to be doubtful whether, when all these things are taken into account, there will be any balance on his available estate; on the other, it is as confidently contended that whatever his property may be (and, with the exception of the entailed, it was left to his wife absolutely), it is not liable for a debt of the bank. This, however, is too "strong" a proposition to be generally accepted. Equity will undoubtedly make his estate liable up to the date of his death, when practically all the liabilities of the bank had been incurred; and if the claim is resisted, the only parties who are likely to profit will be the lawyers. What the value of Messrs. Tweedy's private estate may be is quite uncertain. It does not lie in land, but is considered to consist chiefly of shares and similar investments. On this head, however, full information will be forthcoming.

The effect upon the mining interest in consequence of the intimate connection of the bank with several leading mines was at once seen in the fall in the share market. Among the mines banking with Messrs. Tweedy, Williams, and Co. were Dolcoath, Wheal Basset, Wheal Pevor, East Pool, West Seton, South Crofty, West France, West Basset, West Chiverton, West Pollice, East Chiverton, and Wheal Grenville. In some of these cases the balance overdrawn is very large—at Dolcoath, for example, it is 15,000*l.*; but as, with one or two exceptions, the mines concerned are substantial properties, and can easily obtain an advance from other banks, the amount of inconvenience caused will be but small and temporary. The only pay-day interfered with last Saturday was that of West France, but Mr. Pike was able to obtain what money was required without any difficulty from the Miners' Bank. Messrs. Bolitho are since understood to have advanced what West Basset may need. Any bank would, of course, be glad to have the Dolcoath account, or that of East Pool, West Seton, Pevor, West Chiverton, and others named. The only doubtful cases in which some difficulty may arise it is anticipated may be South Crofty and Wheal Basset, which are by no means in flourishing present circumstances, whatever their prospects may be. But here, also, it is hoped that arrangements may be made to avert any untoward and sudden pressure, which certainly the adventurers would be little inclined to bear.

For a time there was a good deal of uncertainty felt, and the banks in the district made preparations against a run. There was some pressure, but nothing of a really serious character, and confidence may now be regarded as to a great extent restored. Naturally the air has been full of rumours as to what was to come next. However, so far as can be judged at present, the pinch is more likely to be borne by the general interests of the county than specially by the mining. The other banks are doing their best to meet the necessities of the case, but how great was the extent of Messrs. Tweedy's business may be gathered from the following incomplete list of various public bodies who banked with them:—Truro Savings Bank; Truro Board of Guardians (24 parishes); Royal Cornwall Infirmary; Cornwall Railway; Truro Gas Company; Truro Cathedral Fund (part); Cornwall Library; Truro British Schools; Truro Ladies' Bible Society; Royal Institution; Truro Foresters' Court; Truro Working Men's Loan Society; Truro Public Rooms Company; Bankers in many bankruptcy cases; Bible Society; Imperial Fire

and Life Assurance Company; Falmouth Borough Local Board; Falmouth Board of Guardians; Falmouth Parish Local Board; Falmouth United District Sewerage Board; Falmouth Savings Bank; Freemason's Lodge of "Love and Honour"; Falmouth Penny Bank; "Loyal Falmouth" Lodge of Oddfellows; Falmouth Co-operative Society; Falmouth Gas Company; Penryn Town Council; Penryn Penny Bank; Penryn Provident Society; Cornwall Chamber of Agriculture; Truro Fat Stock Society; Truro Agricultural Exchange; Truro Board of Customs; Cornwall Masonic Annuity Fund; Provincial Grand Treasurer for the Masonic body in Cornwall; Williams's Perran Foundry Company; Williams's Perran Company; Williams, Harvey, and Co.; Williams and Son, Tregullov; Unity Patent Safety Fuse Co.; Stannaries Court; Royal Cornwall Agricultural Society; Falmouth and Truro Port Sanitary Authority; Royal Cornwall Sailors' Home; Falmouth Rifle Corps; Falmouth Harbour Commissioners; Falmouth Docks Company; Falmouth Rural Sanitary Authority; Falmouth Hotel Company; H.M. Customs at Falmouth; Falmouth Working Men's Club; Royal Cornwall Polytechnic Society; Penryn Oddfellows' Lodge; Penryn Foresters' Court; Redruth Savings Bank.

It may be advisable, for the sake of persons at a distance, to explain that there were four banking firms in Cornwall in which the name Williams occurs. The Miners' Bank is connected with the Williams family, in which the name is spelt differently. Then there are the West Cornwall Bank, of Mr. John Michael Williams, of Caerhays Castle; and the firm of Messrs. Williams, Williams and Grylls, who have this week extended their business, and opened a branch in Truro. Neither of these concerns has the slightest connection with the defunct Cornish bank, as a short sketch of its history will more fully and clearly explain. Some years since the proprietors of the bank consisted of the Tweedys and the Williams of Scorrer, the families being related by marriage, the late Mr. John Williams, of Burncoose, having married the sister of the elder Mrs. Tweedy, of Truro Veau. A few years ago the partners were the Tweedy family—Mr. W. Tweedy, sen., Mr. William Mansell Tweedy, and Mr. Robert Tweedy, with Mr. Michael Williams, Sir William Williams, and Mr. John Michael Williams. It was understood at that time that the Williams had a slightly preponderating interest. About ten years ago some differences of opinion occurred, and there was an entire change in the composition of the firm. Mr. John Michael Williams retired from the Cornish Bank so far as related to Truro, Falmouth, and Penryn, and took to himself exclusively the bank at Redruth, which from that time became known as the West Cornwall Bank. Mr. John Michael Williams being now the sole proprietor. The partners of the Cornish banks in the three other towns, Truro, Falmouth, and Penryn, were Mr. Tweedy and his two eldest sons, William and Robert, and Sir Wm. Williams; and upon the death of the latter it was understood that one-half of the business of the Cornish bank was in his hands. He bequeathed two-sixths to his son, Sir Frederick Martin Williams, the member for Truro, and the remaining one-sixth to his younger son, Mr. Michael Williams, of Tregullov. Mr. Michael Williams, however, retired from the firm rather more than two years ago, leaving his brother still the owner of one-third of the bank, and the remaining two-thirds in the hands of Messrs. Tweedy. The firm of Williams, Williams, and Grylls arose in this way. When the failure of Messrs. Hawkey, Whitford, and Co., bankers, took place, at St. Columb and Falmouth, Mr. John Michael Williams at once established a branch of his West Cornwall Bank at Falmouth, which, however, was transferred a short time ago to his brothers, Mr. Michael Henry Williams and Mr. George Williams, who associated with themselves Mr. W. M. Grylls, who had been manager of the Redruth Bank for many years previously.

P.S.—The mining interest is even likely to be less affected than we had at first thought; and it is not at all probable that any large quantity of tin will be thrown upon the market out of due course. The total mine indebtedness is but 48,000*l.*, and from this has to be deducted the largest overdrawn account, that of West Basset, which, as already stated, is transferred to Messrs. Bolitho. Dolcoath has a set-off in the shape of 220 tons of black tin in stock. The only two mines having credit balances at the bank were Wheal Grenville and Wheal Pevor, but that of the latter only amounted to 100*l.* There is a strong feeling in the Redruth district that, given time, the concern will pay 20s. in *l.*, and the greatest sympathy is expressed for the Messrs. Tweedy.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Jan. 9.—There are ironworks which have not even up to the present resumed operations since they closed down for the Christmas holidays. The demand is so limited that the orders which the proprietors have received are not such as to place them in a position to recommence production, and even if they were prices are at a level which are discouraging to the last degree. The Quarterly Meetings in Wolverhampton yesterday, and in Birmingham to-day, were no more satisfactory touching the amount of business actually transacted than have been the similar gatherings for half a year back. Some orders were placed alike for raw and finished iron, but makers were generally unprepared to book contracts at the rates which buyers specified. There did not appear to be any great quantity of orders which were to be had at any price upon the market, and such as there were were mostly withheld until the uncertainty which of late has attended the Quarterly Meetings in this district shall have subsided.

At the Wolverhampton meeting the action of pig-iron firms was determined by the Lilleshall Company, who declared no alteration beyond that requisite to adapt quotations to the smaller ton enforced by the Weight and Measures Act. Hence Lilleshall cold-blast pigs are now 4*l.* 5*s.*, and hot-blast 3*l.* 5*s.*, which is an apparent drop of 5*s.* a ton, but in reality no drop at all upon the rates that the firm has been accepting all the quarter, when the larger weight is taken into account. Finished iron was still quoted upon the basis of 7*l.* 10*s.* for marked bars. It became known upon 'Change that the Ironmasters' Association were about to take action with a view to securing the co-operation of other ironmaking districts to induce Government to allow the continued use of the 112 lb. weight, notwithstanding the concession of the 100 lb. (or cental) weight by the Board of Trade. Coal was unaltered in price; in all but domestic sorts trade was very dull.

To-day in Birmingham the ironmasters mustered in strong force at the yearly meeting. The market was glutted with raw and manufactured iron of every kind, and there were great efforts made to effect sales, but without appreciable result. There was no declared alteration in prices, yet they were, as in Wolverhampton, easy. The chief exception was tin-plates, which in some cases were higher than two months ago by 1*s.* 9*d.* Domestic coal ruled firm.

Among the exhibits on 'Change that which attracted the most attention were some samples of patent non-conducting silicate cloth for insulating purposes, which was shown by Messrs. Kettley, Glenclay, and Co. The cloth in question is made from blast-furnace slag, which is first reduced to a woolly state by injecting into it while in a state of incandescence a blast of steam or atmospheric air. The wool thus produced is woven into a thick textile fabric with the help of fine wire, and is backed with rough canvas. In this form it may be conveniently used for coating steam-pipes, boilers, &c., lining fire-proof rooms, or protecting exposed water-pipes from frost, for all of which purposes it is admirably fitted on account of its non-conducting properties. The advantages claimed for it over ordinary boiler coating compositions are that, being a woven fabric, it can be cheaply and readily applied, that it is composed of the best of all known insulating mediums, that it is absolutely incombustible, that it is not affected by expansion or contraction or by vibration, and that it does not exude any leakage. Messrs. Bateman and Co. showed specimens of Ransome's patent emery wheels, and a model of a new and economical self-feeding lamp, and Mr. Bolton showed examples of collographic printing.

The question as to how far the use of salt in puddling can be made a means of profit to ironmasters is just now engaging considerable attention in South Staffordshire. Proprietors of mills and forges are in several directions making experiments in the matter. Con-

spacious are the trials which this week are taking place at the E-and Oak Ironworks of the Earl of Dudley. There Mr. James Barnett, of Birmingham, who is the patentee of the method at present most generally known hereabouts, is conducting experiments. Some time ago Mr. Barnett was engaged in similar trials at the same works, but they were unsuccessful because, as he makes known, of the opposition of the puddlers, but that this was the sole reason the management is hardly prepared to concede. The result of the experiments at the Round Oak Works will be of unusual interest, as not only are gas puddling furnaces in operation there but also puddling furnaces heated in the ordinary way. Mr. Barnett's system has proved an undoubted success at the Castle Ironworks, Wellington, where gas puddling furnaces are in use. At these works a saving is being effected of from 30% to 40% a week by reason of economy in the fettling required to preserve the sides and bottoms of the furnaces, independently of any saving, which is considerable, resulting from the use of a proportion of less valuable pig-iron than it has hitherto been usual to employ, without any detriment to the finished product.

A meeting of the creditors of Mr. William Rose, of the Batman's Hill Ironworks, Bradley, who suspended payment recently with considerable liabilities, has been held. The statement of affairs showed a surplus of assets over liabilities, but as the realisation of the assets, which consisted largely of the works and plant, valued at 7840*l*, would at such a time as the present result in a loss, it was determined to wind up the estate in liquidation. The debtor was granted his discharge.

In North Staffordshire no improvement in business has marked the opening of 1879. Trade remains quiet.

IMPORTANT COLLIERY ARBITRATION.—The commencement of the arbitration case, Martin v. Griffiths, Griffiths, and Bickley, took place on Tuesday and Wednesday, at the Queen's Hotel, before Mr. Bosanquet, to whom a judge referred the case. The plaintiff is the owner of 10 or 12 houses at Dudley Port, and the defendants have recently been working the New Denbigh Hall Colliery. Mr. Alfred Young (instructed by Mr. S. T. Fellows) was for the plaintiff, and Mr. Underhill (instructed by Mr. Stobbs) was for the defendants. Mr. Martin claimed damages for the racking of his houses and the destruction of a water-course by the mining operations of the defendants. The plaintiff's case had not been completed when the Court adjourned until the end of the month. For the plaintiff the following mining engineers are engaged:—Mr. David Peacock, Mr. Joseph Cooke, Mr. W. J. Hayward, and Mr. J. Tomson. For the defendants:—Mr. Henry Johnson and Mr. John Field. *—Birmingham Daily Post.*

REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

Jan. 9.—The Abercarn Colliery explosion enquiry has been resumed this week, and will probably go on for two days more at any rate. The Coroner, Mr. Brewer, has been assisted by Mr. Wheelhouse, Q. C., who has been sent down by the Home Office. Mr. T. Wales, Mines Inspector for South Wales; Mr. Cadman, the Inspector for the Western District; Mr. Bain, Assistant Inspector; Mr. C. Pond, manager of the Abercarn Pit; Mr. Jordan, mineral agent; Mr. Green, manager of the Celynen Colliery, and others, have been present. Mr. J. E. Ward, solicitor, Newport, appeared on behalf of the Ebbw Vale Company; Mr. Walter Morgan represented the men and relatives of the deceased. No evidence has yet been given throwing a light on the cause of the explosion, and owing to the impracticability of exploring the pit no scientific testimony has been produced. It is to be feared the circumstances which led to the explosion will ever remain a mystery. The company have already stopped operations for extricating the bodies in the direction of No. 21 district, where many bodies lie, and a deputation of widows having waited upon the Coroner with regard to this matter were informed that he could not interfere. A communication has, however, been made to the Home Office, and the reply received will no doubt guide the company as to what steps they will take. Setting aside the question of settlement—a feeling natural enough on the part of the relatives—there are many who think the wisest course would be to close up the pit.

A large find of coal has taken place in the Garw Valley, Glamorganshire. After much perseverance and after passing two smaller seams the Ffald Steam Coal Company have struck the 6-foot seam of steam coal. The company is said to be composed mainly of working men. The first load has been raised, and great rejoicings followed.

Mr. Evan Foster, manager of the Ystradgawr Colliery, Ystradgynlais, has had his certificate suspended for six months by Mr. Rothery, commissioner appointed by the Home Office to hold an inquiry, which took place at Swansea. Mr. Thos. Cadman (Mines Inspector) assisted as assessor. An explosion took place in the pit; and the offence was in not having sufficient ventilation in a certain level. Up to that occasion (Mr. Wales, Government Inspector, remarked) Mr. Foster's conduct had always been most prudent. The defence was that there had been no wilful neglect.

Another charge against a colliery manager has been heard at the Pontypridd Police Court. Wm. Rosser, head manager of Fowler's Collieries, and Edward Williams were charged with a breach of the Mines Regulation Act for gas having been found in the colliery during the preceding three months, having powder in the pit except in cartridges, an explosion occurred in the pit in September last. The Bench adjourned their decision.

On the expected resignation of Dr. Ball, medical officer to the Blaenavon Work, it is believed Dr. Quirk, his principal assistant, will be appointed to the office.

Stephen Lewis, a fireman at the Glamorgan Coal Company's Colliery, charged the manager, Mr. Joshua Davies, with illegal dismissal, and he claimed 7*l*, in lieu of a month's notice. The complainant was discharged for the action he took with regard to clearing away some gas. The Bench ordered the amount claimed to be paid, and said complainant had not misconducted himself.

Yet another petition for winding up, and in this case again a friendly one. I allude to the Landore (Siemens) Steel Company. The petition has been presented with a view to satisfy certain debenture-holders, and it is to be hoped that an amicable settlement may be come to. Dr. Siemens himself is the largest creditor. There is no fear—certainly not at present—of the works being closed. The general position of the Iron and Steel Trades is unaltered; there is no movement of any importance in trade, and prices remain at the same unremunerative ebb. The demand for all descriptions of finished iron is very dull, and clearances during the last few days have been small; in fact, for some time these have shown a decline. It is apparent that if some of the works are to be kept going a further reduction in wages must take place, and a notice to terminate contracts, posted at the Dowlands Works, is construed as having that intention. Wages are low enough now, but must be brought lower if masters are to be enabled to take orders at present prices. In rails there is but little doing, and scarcely anything, comparatively speaking, doing in bars. The steelworks are apparently not quite so well employed.

The Tin-Plate Trade maintains a slight improvement both in the demand and in prices. At Llanhennoch notices to terminate contracts have been posted—it is said with a view of lessening wages.

As for the Coal Trade, about the usual amount of activity is observable. There is a tolerably good demand for steam coals, and clearances have been rather above the average. The cold weather (which has increased the distress in the district) has also improved the demand for house coals. There are some good orders for patent fuel in hand, but shipments are rather small. No alteration in prices can be quoted. The colliers at the Pwllsaint pit, Forestfach, near Swansea, have struck work in consequence of a dispute as to the cutting prices allowed.

Mr. H. H. Vivian, M.P., referring at the Swansea Savings Bank meeting to the present commercial distress as being greater than he had known during the last 37 years, said it was very satisfactory to find that the industries of the district were in active work. There was as much money paid weekly in the copper works now as had been paid for the last ten years, and the men were receiving higher wages.

The New Fancy and Parkend Royal Collieries, the property of Mr. James Wood Sully, of Bridgwater, are to be taken over by a new company, called the Parkend Coal Company (Limited). The

capital of the company is registered at 80,000*l*, in shares of 80*l* each. No shares will be offered to the public, the allotment being confined to the members of Mr. Sully's family, with the exception of the colliery manager, Mr. Sydney J. Thomas, who joins the new company. The business will be carried on as usual, Mr. J. W. Sully acting as chairman of the new company, and Mr. John George Sully as general manager.

RICHARDS AND COMPANY (LIMITED).

SIR,—I was not able to be at the meeting of this company, but I hope the shareholders kept in view the guarantee. We (the shareholders) have nothing to do with any losses incurred during the five years of the guarantee, which ends next September. The vendors under their guarantee must make good all losses, and in addition pay 10 per cent. per annum to the shareholders. The prospectus is as clear as possible upon the point, and I, therefore, trust the shareholders' committee will see that our rights are strictly preserved. We want nothing more than was solemnly and legally promised us, and our solicitors (Messrs. Baxters) ought to see that we are properly protected. A SHAREHOLDER.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Jan. 9.—For the first time for thirty years, as it is said, the men at the Penrhyn Slate Quarries have been put upon short time; they now work only four days a week. The same arrangement has been adopted at the neighbouring Dinorwic Quarries, while many of the smaller quarries are literally doing nothing. In the Festiniog district the severe weather has completely stopped work at the slate quarries, and between 3000 and 4000 men are idle. Traffic is impossible on the little railway from Duffwys to Festiniog village, and the line from Duffwys to Portmadoc is worked with difficulty, a pioneer engine being thrown off the line last week while an attempt was being made to clear away the snow. The Tyn-y-Coed Slate Quarry at Arthor stopped work on December 28. All roads are to be taken up, so it looks like abandonment; about 130 men will be thrown out of work. There is not now I think one slate quarry at work in the hills on the south side of the Barmouth estuary. The slates just there being somewhat rough and pyritous, and the slate rock somewhat uncertain, the locality is one of the first to suffer in bad times. The severe weather has also stopped the works of progress at the new slate quarries on the Whitland and Cardigan Railway. Before the frost had set in the branch line from the Elwyn Valley Quarry had been completed to within a few yards of the railway, and the siding at Pencelly Quarry had been commenced. With the return of milder weather operations will, it is said, be vigorously resumed at these quarries.

The magistrates of Cardigan, in Quarter Session assembled, have been discussing the desirability of having the county surveyed on a scale of 25 in. to a mile, on account of its importance as a mining county, and representations are to be made to the Government on this point. Talking of maps, I should like to suggest to Mr. Absalom Francis the desirability, should a second edition of his map of the mines of Cardigan be required, of introducing some of the principal roads, rivers, and a few of the physical features of the country into it. If a few sections of the mines could be added it would increase the value of the map.

Mr. Shone, the Mayor of Wrexham, who is professionally a mining engineer, has been making light of other of Her Majesty's servants. He thinks lessons on chemistry in general, and on the composition of the gases of coal mines in particular, would be much better than the employment of Inspectors as at present. But surely we could do the one thing without leaving the other undone. Could we not have Inspectors who, from their superior and comprehensive knowledge, would sustain more of the character of advisers and friends than that of informers and public prosecutors, together with elementary lectures on the chemistry of mining—like those just now given by Mr. Thomson, chemist to Young's Paraffin Light Company?—at which all foremen, overmen, and underground managers should, with as many of the ordinary miners as possible, be expected to attend. Nay, should not the teaching given in elementary schools be adapted to the industrial requirements of the districts in which they are situated? What should hinder a lad who is going to be a collier knowing as much of the chemistry of gases when he leaves school as he is expected, for example, to know of vulgar fractions or the geography of the Indian Archipelago?

The proprietors of the Brymbo Colliery, in presenting a petition to the Great Western Railway Company for a reduction of rates for carriage, give a list of colliery companies now in the course of liquidation in North Wales. It seems too bad, however, that they should head the list with the name of the Vron Colliery, a colliery which can pay its debts, and which has a balance at its bankers. Still the rates on the Great Western Railway need reducing, as I have more than once pointed out, if the North Wales collieries are to successfully compete with those of Lancashire and North Staffordshire.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Jan. 9.—Work has now got into the old groove again after the holidays, but, with the exception of the colliers, workmen are no better off than they were before the Christmas holidays set in. The Iron Trade in all branches is still quiet, without signs indicating any improvement. Makers of pig have found some difficulty in effecting sales, even at existing low rates, owing to the competition of the Cleveland and other makers in all markets where the consumption is at all large. Finished iron is also in but dull request, there being a very moderate demand for mill or foundry material; so that the year has opened out with a less number of men at work than there was in the early part of 1878. The works at Dronfield have been kept well going during the past year, but now some alterations are going on with respect to increasing the production of Bessemer rails that will keep the men idle for a time. So keen, indeed, is the competition on the part of Bessemer railmakers, and so low have the prices come down, that it requires every effort, and the most economical appliances, to ensure even a very small profit. For some time past statements have appeared in the papers to the effect that a large number of colliers were about to strike, in consequence of having received notice of a reduction of wages to the extent of 12½ per cent. It turns out, however, that so far only the men at two or three collieries have received notice, and those belong to what is known as the Coalowners Association, a body started a few years ago, on the limited liability principle, for the purpose of supporting the members against attacks from the men on the wages and other questions. In Derbyshire, however, the Coal Trade has been rather active of late, with a brisk demand for the London market, prices in which during the last week have advanced fully 1*s*. per ton, so that consumers have now to pay more than they did during nearly the whole of last year. Some delay, however, has taken place during the week in getting the empty wagons returned, a by no means uncommon complaint under ordinary circumstances, but now to some extent excusable, owing to the strike of the goods guards and others.

Several of the Sheffield trades have opened out better than was expected, two or three of the leading firms engaged in the finest qualities of cutlery being able to keep their hands very fairly going; but in inferior pocket and other knives there has been no change for the better. Some of the mills have been running tolerably well, while the Bessemer establishments are working full time; but it is evident that there is not that activity there was during the greater part of last year, and it is said that orders are fast being worked up. In cast-steel there has not been any material change so far, but there is every prospect that this important department will be much better than it now is, seeing that steel is now being adopted for so many purposes for which iron alone was formerly used, the only thing required being to have steel uniform in quality, and at a moderate price.

Barnsley, as the head centre of the Miners' Association, during the last week has become a place of more than ordinary importance, seeing that we are told that from 80,000 to 100,000 men are likely to come out on strike. From personal enquiries made on the spot, we find that the number of men who have received notice of reduc-

tion of wages in South Yorkshire and North Derbyshire does not exceed 9000. At the meeting of the delegates of the various lodges connected with the Association of Miners, held on Monday at Barnsley, it was agreed that the proposal of the masters should be most strenuously opposed. The notices given are principally those of colliery owners who belong to the Colliery Proprietors Association, and who are indemnified for any losses occasioned by strikes. There is, however, a very strong feeling that should there be a strike it will be confined within a very limited area, as the great bulk of the colliery owners are opposed at the present time to any movement that will curtail the trade, which at the present time is more active and more profitable than it has been for a long time past.

In steam coal very little has been done, and prices are remarkably low; 6*s*. to 6*s*. 3*d*. per ton not even tempting merchants to buy. Engine coal has been very quiet, and there has been a marked falling off in the consignments to the Lancashire and Cheshire markets.

REPORT FROM THE FOREST OF DEAN.

Jan. 9.—We are happy to report that the improvement in the Coal Trade has been well sustained since our last communication on the trade of this district. And since that date coal has advanced 1*s*. a ton, making a total advance of 1*s*. 6*d*. per ton to merchants into trucks, but in some instances the price has been advanced 2*s*. per ton to what is called the land or country trade. The prices now range from 7*s*. 6*d*. to 10*s*. 6*d*. per ton, according to quality—nuts, rubble, block, and best Forest block coal. Lime coal ranges from 3*s*. 6*d*. to 4*s*. 6*d*. per ton. The very severe weather has, no doubt, assisted to keep up the briskness in the trade, and were it not that extreme cold is unpleasant to the feelings, and especially so to invalids and the destitute, we should be tempted to wish the present kind of weather to last, minus the snow. A temporary stoppage or two have been reported in West Dean, but the water, which has occasioned them, is likely to be got under, and operations recommenced. It is a painful exception to record, but the Bilson and Crump Meadow men have strangely been left out of the 5 per cent. rise in colliers' wages which has followed the advanced prices in coal, dating from the first of this month. We have also to notice the change of proprietorship in relation to the Fancy pit, of which Mr. Sully, of Bridgewater, is owner. The company to be created with a capital of 80,000*l*, in 80*l* shares, will, it is said, be taken up by members of his family and immediate friends, as, with one or two exceptions, none will be offered to others. As Mr. Sully has a large family grown up, the arrangement looks like a method of providing against the time when he may be in a better place, as we know that that is what he anticipates for himself.

The Messrs. H. Crawshaw and Sons are so busy at Lightmoor that they have added the night turn this week. Yet, with the gratifying improvement in the coal trade already stated, there are even now many colliers without work, and there is still much poverty, and many instances of distress. But what would have been the case this winter had not improvement come? We are almost appalled at the very idea in thinking of it. Thank Providence, some amelioration has come, and may it continue and increase. Hope continually turns towards the Severn Bridge, which is rapidly drawing to its completion, excepting that this bitter cold weather almost renders it impossible for the men to stand on such a bleak elevation. The approaches are well advanced, and most of the railway work of the Severn and Wye Company has been effected, so that early in the coming summer the bridge will be substantially finished as to its spans, girders, and flooring, but it is thought midsummer will arrive ere it is opened, but nothing definitely can at present be said on that subject. Some are of opinion that the work will be sufficiently advanced by March or April next to admit of the bridge being used, and it is to be hoped that no unnecessary delay will be indulged in as to its being opened for traffic; as, besides the mineral traffic over it, which is looked for, it will be the most direct and convenient route for foresters and others on the borders of Herefordshire adjoining when desirous of visiting Bristol for either business or pleasure.

The new tinworks of Mr. J. Chivers, at Churchway, a short distance from his colliery, called Hawkwell, are also drawing towards completion, and are now so far advanced that a limited staff of men from Wales are engaged in preliminary operations in anticipation of the actual commencement of tin making. It is expected that a proper commencement of work will be inaugurated at an early date. We wish Mr. Chivers every success, and wish, too, that other local colliery proprietors would follow his example in attaching some suitable manufacturing or other products in connection with their coalworks, and in that way be their own customers for coal.

The sewage and waterworks difficulties are every now and again cropping up. The sanitary authorities having applied to the Government Board in London, a civil engineer will attend for an enquiry at Cinderford Town Hall on Jan. 16, the same gentleman that was there on the last occasion of enquiry. The sanitary authority wants to borrow 1800*l*. more; but as the people are beginning to feel the smart of increased burdens in the shape of heavy rates, it is expected that a good deal of opposition will be manifested against the proposal.

TRADE OF THE TYNE AND WEAR.

Jan. 9.—The Coal and Coke Trades are not materially changed. The best steam, house, and gas coal works are fairly employed, and for first-class coal it may be said a fair price—at least a price giving some chance of profit—is received. But for all manufacturing and second-class coals the competition for sale is keen, and consequently prices are extremely low. Best class house coals are from 9*s*. to 10*s*. per ton, but for furnace and locomotive coals, &c., extensive contracts have been entered into in some cases at 5*s*. 9*d*. per ton; these prices mean small profits, if any, and low wages for the miners and others. However, there is no alternative; either those prices must be accepted or the works stopped. Wages are still being reduced, and works closed from time to time. Best coke is now worth 10*s*. 6*d*. per ton at the ovens. In Durham there are upwards of 2000 men under notice for reductions varying from 5 to 10 per cent. There are some stocks of coal and coke at some of the works—in some cases about a month's work is in hand—but any great increase of the demand would cause those stocks to be reduced or cleared off. The colliery enginemasters in the Northumberland collieries have received notice of a reduction in their wages of 10 per cent. The men have offered to accept a reduction of 3*d*. per day, but threatened very serious opposition to the reduction of 10 per cent. However, at present it appears to be probable that there will be no lock-out, but that the men will accept the terms offered. In Northumberland the best steam coal works are well employed—about five days per week; and many of the works in Durham are also employed ten days per fortnight. The general trade on those rivers continues dull, but fair shipments of chemicals continue to be made to America.

The future of the iron trade, on which so much depends, appears at present to be involved in mystery. Of course, if the make of Cleveland pigs is kept up or increases it will have a very important effect on the coal and coke trades. The make of pig-iron during the past year is 2,023,177 tons—115,000 tons less than in the year previous, which is comparatively a favourable result. The stocks of pig-iron on hand are considerable. At present a severe struggle is going on between the Cleveland ironmasters and the Scotch ironmasters. What the result will be remains to be seen. The Cleveland ironmasters have sent a large quantity of pig metal to Scotland lately, and the Scotch makers wish to prevent this if possible by reducing the price of iron made in the Glasgow district. Iron shipbuilding in the Wear and Tyne has, on the whole, been good during the past year, and enough work is still on hand at the largest works to keep them going the first quarter of the present year. Cheap coal and the reduction of the price of plates have enabled iron shipbuilders to compete with the Clyde and other districts. Shipbuilders have fallen in price enormously during the past few years; indeed, from upwards of 12*l*. per ton to a little above 6*l*. per ton. Of course, marine engine and boiler builders have shared to a considerable extent in the prosperity thus brought to the district.

Two large steamers have been ordered in the Tyne during the present week.

The Quarterly Meeting at Middlesbrough on Tuesday, which was looked forward to to indicate the course of trade for the early part of the year, passed over without giving any better prospect. There were a few enquiries reported for pig metal, and it is believed that consumers will shortly be compelled to come rather more freely into the market. As, however, compared with last week, prices were scarcely so firm. As a whole, makers do not incline towards entering into any fresh business to any extent except for short periods. The general makers' quotation was about 35s. for No. 3, but business is done between 34s. 6d. to 34s. 9d. for this quality, No. 4 forge being 34s. to 34s. 3d., less 1 per cent. commission. The shipments to Scotland last week were on a reduced scale. The returns of stocks of pig-iron for the North of England and Cleveland districts show a considerable increase of stocks in December, consequent upon a decline in the shipment foreign and coastwise of about 6000 tons, and the lessened local consumption during the holidays. The total increase for last month amounts to over 31,000 tons. There are now in makers' hands and in warrant stores stock amounting to 333,337 tons, of which 89,000 tons are in makers' stores and in warrant stores, and the remainder in makers' hands. There are 92 furnaces blowing, and 73 out of blast, but 3 more are to be stopped at Clay Lane. The total make of all classes of iron last year was 2,023,177 tons—115,000 tons less than in 1877. Although this particular return may be regarded as unsatisfactory, taking the whole year, and considering the state of trade, things might have been expected to be far worse than they have been. At the Middlesbrough shipyard of Messrs. Dixon, the riveters and platers having refused to work, about 600 men have been laid off, a reduction of 5 per cent. having been demanded. At the Eston steelworks the men are on strike rather than accept a reduction of 10 per cent. A general movement to reduce wages in shipyards on the Tees is being inaugurated. The Middlesbrough works of Thomas Vaughan and Co. have been stopped, but those at Witton Park have been re-started at a reduction of 5 per cent. The Britannia Plate Mills have been stopped for a month. There is no change in prices of finished iron, and the demand keeps sluggish. The only article exhibited to-day was Wood's wrought-iron patent sleeper and chair-clip, with rails fixed, showing the principle.

Messrs. Bolckow, Vaughan, and Co.'s new steelworks have made during the year 75,000 tons of steel rails, and are now in a position to make at the rate of 2000 tons per week.

SALE OF THE WHESSE IRONWORKS, DARLINGTON.—Mr. C. Willman, C.E., offered for sale, by order of the trustees of Thomas Vaughan and Co., the whole of the fixed plant and material at the Whesse Ironworks, Darlington. The Whesse works were started after the great strike in the iron trade of 1866 as a co-operative concern by some of the ironworkers, but chiefly because of lack of capital to carry them out they failed soon after they had been got into work. The works were bought by Messrs. Thomas Vaughan and Co., and were laid out for the manufacture of iron rails and puddled bars. They were, however, brought to a stand some time before the failure of that firm. At the beginning of last year Mr. Willman sold the lease plant at the works, as no offer for them could be obtained as they stood, and it having since been determined that the works should be thoroughly dismantled, the sale as stated has taken place. The plant consisted of steam hammers, rail shearing machines, rail mill, and auxiliary engines, boilers, railway switches, crossings, sleepers, iron roofing, a large quantity of furnace castings, the brickwork and iron work of 25 puddling furnaces, chimney stacks, 10 boiler chimney stacks, &c. There was a good number of gentlemen, chiefly brokers, from Leeds, Sheffield, &c., who chiefly deal in such materials, who bought pretty freely, as also did Mr. R. Richards, Middlesbrough. The leading buyers were Messrs. Putman and Hodgson, of the Darlington Forge Works. On the whole, better prices were made than was expected, the bidding in some cases being very spirited. Above 3000% was realised. The trustees still hold the land on which the works were placed, and certain buildings.

IRONSTONE MINING IN 1878.

Like many other descriptions of raw material for manufacturing purposes obtained at home, the production of ironstone has declined during the year in nearly every district where it is principally obtained. This, of course, is only what has been expected, seeing that the consumption of pig for all ordinary purposes, with the exception, perhaps, of that required for converting into steel for Bessemer rails, has been below that of some former years, as evidenced by the depression in the finished iron department in Sheffield and other places, the number of furnaces that have been out of blast, the many plate and other mills that have been standing, and the comparatively limited business done in every description of foundry material. Hematites have kept up better than other qualities, but they only amount to about one-sixth of the entire yield, Lancashire and Cumberland furnishing the principal supplies, Ireland standing next, whilst for some years past less has been raised in South Wales, whilst there has also been a decrease in the ordinary argillaceous ores of the coal measures obtained in that part of the Principality. On the other hand, our imports from Spain, Algeria, &c., have been up to about the average. In the production of British ores Cleveland takes the first place, being credited with about two-fifths of all the stone worked in the various mines in the kingdom, or got from the surface, and which for 1878 is estimated at 16,000,000 tons, being less by about 600,000 tons than given in the returns of 1877. Seeing that the make of pig last year was less by about 100,000 tons than in the previous year, the falling off for the year is expected to be about 400,000 tons, so that the yield will be about 5,900,000 tons out of a total for the United Kingdom of something like 16,000,000 tons.

In the West Riding of Yorkshire, where the ore is principally worked in connection with the coal measures, there has been very little change, and there is not likely to be any material falling off as compared with 1877, the quantity being close upon 400,000 tons. Next to Cleveland in productive power is Northamptonshire, a field which has grown rapidly during the last few years. A proof of this is shown by the annual returns, from which it appears that the quantity of ironstone raised in the county in 1863 was 449,116 tons, whilst in 1878 it had reached to 1,049,306 tons. For this great increase in such a short time the author of the "History and Directory for the County of Northamptonshire" states in that work that the credit in a great measure is due to a series of articles which appeared in the *Mining Journal* with regard to the ironstone of Northamptonshire, which was the means of directing the attention of the ironmasters in other districts to the vast field of stone which was lying fallow close to the surface, and offered at a very reasonable royalty. Wellingborough is still the head-quarters of the trade, and from there about 35,000 tons a month are sent northwards, principally into Derbyshire, to which the Midland Railway Company gives a moderate rate. A good deal is also sent to South Wales from the neighbourhood of Blisworth and Towcester. At the latter place Dr. Siemens, in connection with some other gentlemen, has established works for making iron and steel by the direct process, although many persons considered the ores of Northamptonshire were not suited for that purpose. The ironstone of Lincolnshire is similar to that of Northampton, with the exception that there is more lime in it, and it has met with a fair demand during the year in Yorkshire, Derbyshire, Staffordshire, &c., but this year will show a slight falling off, but the county since 1859, when the stone was first worked, has made very rapid progress indeed, the production having increased in 20 years from 2000 tons to 508,740 tons. Staffordshire, before the Cleveland district was developed, raised the largest quantity of ore in England, but now it holds a comparatively subordinate position to what it did, and has to depend largely upon other districts to supplement the local output. In 1855 there was raised in that county 2,500,000 tons, whilst last year the production was about 1,800,000 tons. There are extensive beds of stone in Derbyshire, especially in connection with the coal measures, but very little attention is paid to them, for ironmasters in that county appear to prefer taking supplies from Northampton-

shire to working their own ores. The ores in the former county, it may be said, are more silicious than those of Derbyshire, and are therefore well suited for mixing with the more argillaceous ores of Derbyshire. Shropshire is another county where during the last few years there has been a gradual falling off in the out-put of ironstone, the quantity being comparatively small. Northumberland and Durham at one time raised a fair quantity of hematite, but not so much of late years.

From some of the collieries also a good deal of stone has been obtained, but the two counties named have ceased to be of any importance as producers of ironstone. Warwickshire and Nottingham of late years have given us some stone from the coal measures, but only at the rate of about 90,000 tons a year. During 1878 the iron trade of Lancashire was by no means brisk, but as the stone raised there is hematite of a very fair quality, and whilst a large tonnage is consumed in the furnaces at Barrow, Kirkless Hall, Carnforth, &c., a considerable quantity is sent into North Wales, Scotland, Staffordshire, Yorkshire, &c. The estimated produce for the year is put down at about 900,000 tons, and that total is not likely to be exceeded. Cumberland ore is similar to that of Lancashire, and some portions of it are unequalled in richness of metal. About two-thirds of the output is consumed by the local furnaces, and the rest sent into other districts. The produce is not likely to be equal to last year, when 1,351,441 tons were turned out, for the mines have not been regularly worked. South Wales some 25 years ago used to produce fully one-sixth of all the stone worked in the kingdom, but now it does not raise more than one-fifth of what it did, and now depends upon Northamptonshire and other counties for what it requires, which last year unfortunately was by no means large, but the prospects are now brighter than they were. In Scotland the produce of pig in 1878 amounted to 902,000 tons, against 982,000 in 1877, being a decrease of 80,000 tons. It may, therefore, be assumed that there will be a decrease in the consumption of ironstone last year of about 200,000 tons, as compared with 1877.

Ireland has some good fields of iron ore, but they are not developed with that energy that might be expected, seeing that labour is cheap in the country—some of the ore giving as much as 45 per cent. of metallic iron. In Leitrim the clay ironstones are found in the shales of the coal measures as well as in the beds below, and are, perhaps, the richest found in Ireland. They were formerly smelted at furnaces at what were known as the Tongue Ironworks, on the shores of Lough Allen. In Antrim there are some fine beds of blackband ironstone, which is calcined after being brought to the surface, when it is then shipped to the opposite coast of Ayrshire, and smelted at the furnaces in that county. In summing up the production of stone for last year we believe it will be found to be about 800,000 tons less than 1877, and will, therefore, be slightly under 16,000,000 tons. It is likely, however, that during the present year we shall have a change for the better. As showing the growth and decline of our several ironstone fields we append the percentages raised in each of them in the years 1855 and 1877-8, as follows:—

	Per cent. 1855.	Per cent. 1877-8.
Cornwall, Devon, and Somerset	1	1
Gloucester	1	1
Northamptonshire	26	10
Stafford and Worcestershire	—	3
Lincolnshire	4	1
Shropshire	4	1
Derbyshire	12	40
Yorkshire	2	1
Northumberland and Durham	2	1
Cumberland	3	6
Lancashire	1	3
North Wales, &c.	17	3
South Wales	25	16
Scotland	—	1
Ireland	—	100
Wiltshire, &c.	—	2=100

Lincolnshire and Wiltshire were not discovered in 1855, whilst very little stone was sent from Ireland in that year.

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YORKSHIRE.

In the High Court of Justice—Chancery Division.

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Index plans and particulars and conditions of sale are in course of preparation, and may be had fourteen days prior to the sale (of which further notice will be given) of Messrs. PATTERSON, WIGGS, and Co., Solicitors, 11, Queen Victoria-street, London; of Messrs. DIBBS and Co., Solicitors, Leeds; of Messrs. DOWDY and Co., Solicitors, 6, New-square, Lincoln's Inn, London; of Messrs. LAMBERT, PETCHE, and SHAKESPEARE, Solicitors, 5, John-street, Bedford-row, London; of GEORGE ARMSTRONG, Esq., Solicitor, Newcastle-on-Tyne; of Messrs. SHUM, CROSSMAN, and Co., 3, King's-road, Bedford-row, London; and of Messrs. HEPPER AND SONS, Auctioneers, Leeds.

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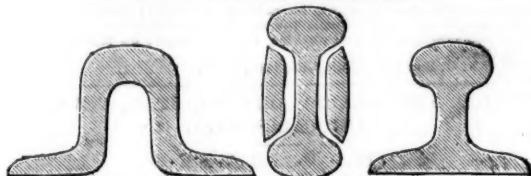
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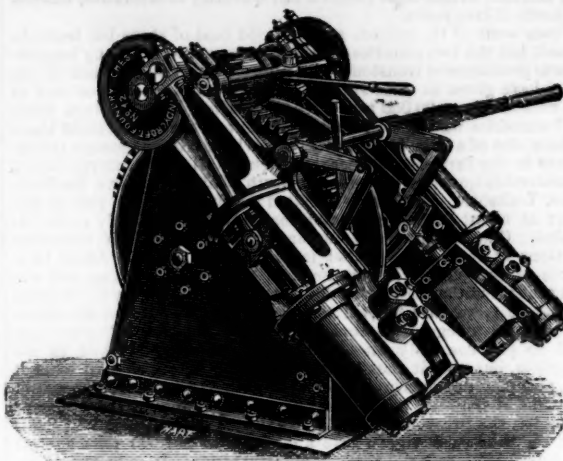
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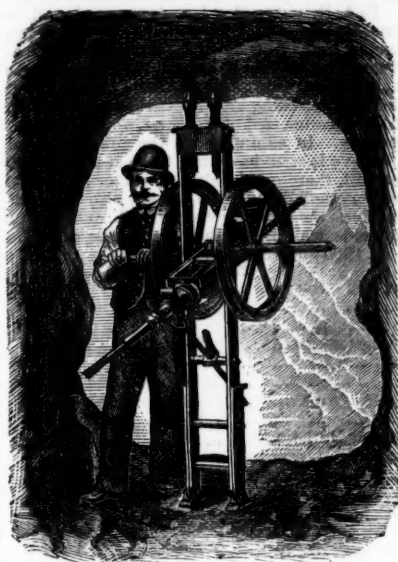
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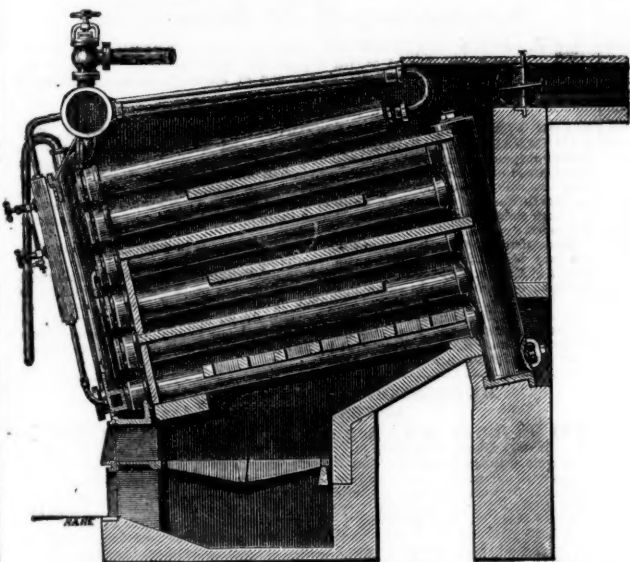
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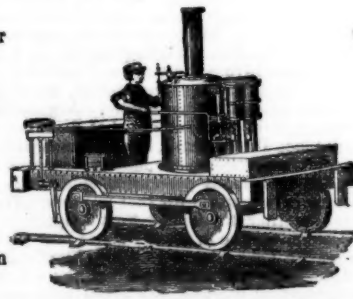
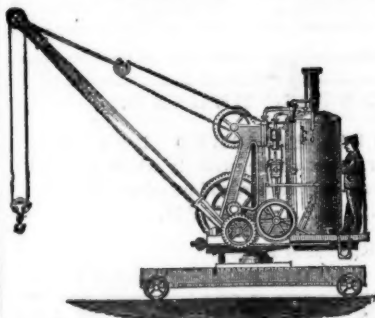
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Charcoal and Steel Wire Ropes (Flat and Round), of best
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 Ditto Flat Ropes ditto ditto
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BRITISH DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last wk.
2000	Bryn Alyn, s, Denbigh	10 00	...	...	0 7 0	0 7 0	Jan. 1877
10000	Caron, i, Cardigan	2 00	...	...	0 4 0	0 4 0	Oct. 1878
1000	Carn Brea, c, t, Illogan	58 7 6	...	...	...	...	...
400	Cashwell, i, Cumberland	2 10 0	...	...	...	...	...
2450	Cook's Kitchen, c, Illogan	28 4 9	...	...	...	...	...
240	Devon Gt. Consols, c, Tavistock	1 00	...	...	...	...	...
4295	Dolcoath, c, t, Camborne	10 14 10	...	...	...	...	...
5000	East Black Craig, s, i, Scotland	32 0 0	...	...	...	...	...
300	East Darren, i, Cardiganshire	82 0 0	...	...	...	...	...
6400	East Pool, t, c, Illogan	0 9 9	...	...	...	...	...
40000	Glasgow Carr, s, (30,000 £1 p., 10,000 15s. p.)	...	...	...	...	...	...
1500	Goredd and Merilyn Cons., i, Flint	2 10 0	...	...	...	...	...
615	Gt. Bealack, i, t, Ferransabulo	5 18 6	...	...	...	...	...
6400	Green Hurth, i, Durham	0 0 0	...	...	...	...	...
40000	Grogwion, i, Cardigan	2 0 0	...	...	...	...	...
9880	Gunnislake (Oliet), t, c	5 8 0	...	...	...	...	...
50000	Holmbush, c, c, s, i, Callington	1 0 0	...	...	...	...	...
2800	Isle of Man, i, Isle of Man	26 0 0	...	...	...	...	...
20000	Leadhill, i, t, Lanarkshire	6 0 0	...	...	...	...	...
400	Liaburn, i, Cardiganshire	18 15 0	...	...	...	...	...
14000	Llanidloes, i, t, Montgomery	3 0 0	...	...	...	...	...
9000	Marke Valley, c, Linkinhorne	5 3 6	...	...	...	...	...
10000	Minellor Copper, Hayle	2 0 0	...	...	...	...	...
9000	Minora Mining Co., i, Wrexham	5 0 0	...	...	...	...	...
20000	Mining Co. of Ireland, c, i, s	7 0 0	...	...	...	...	...
1024	North Busy, c, Chacewater	1 14 9	...	...	...	...	...
10289	North Hodge, c, i, Wales	2 1 0	...	...	...	...	...
30400	Panty Mwyn, s, i, Mold (8704 iss.)	2 0 0	...	...	...	...	...
8000	Pedra-an-dra Co., t, Redruth	0 8 8	...	...	...	...	...
5000	Penhalls, t, St. Agnes	3 5 6	...	...	...	...	...
8000	Pennant, i, bar, North Wales	5 0 0	...	...	...	...	...
45798	Penrthral, s, i, c, Gwynnapp	5 0 0	...	...	...	...	...
18000	Prince Patrick, s, i, Holywell	2 0 0	...	...	...	...	...
10000	Red Rock, s, i, Cardigan	1 0 0	...	...	...	...	...
15000	Roman Gravel, i, Salop	2 0 0	...	...	...	...	...
512	South Caradon, c, St. Cleer	1 5 0	...	...	...	...	...
5123	South Curdow, c, t, Camborne	5 8 8	...	...	...	...	...
12000	St. Harmon, s, i, t, Montgomery	3 0 0	...	...	...	...	...
4000	So. St. Patrick, s, i, (8000 iss.)	1 0 0	...	...	...	...	...
10000	South W. Frances, t, Illogan	7 12 4	...	...	...	...	...
12000	Tantville, i, Salop	6 0 0	...	...	...	...	...
5000	Tinor, t, c, t, Pool, Illogan	11 10 0	...	...	...	...	...
18000	Van, i, Llanidloes	4 0 0	...	...	...	...	...
3000	W. Chiverton, i, Ferransabulo	12 10 0	...	...	...	...	...
175	West Fildes, St. Day	1 0 0	...	...	...	...	...
512	West Tolgas, c, Redruth	9 10 0	...	...	...	...	...
5048	West Wh. Frances, t, Illogan	28 16 3	...	...	...	...	...
600	West Wye Valley, c, Camborne	3 5 6	...	...	...	...	...
12000	West Wye Valley, c, Montgomery	3 0 0	...	...	...	...	...
1024	Wh. Eliza Consols, t, St. Austell	18 0 0	...	...	...	...	...
2048	Wheel Jane, t, Kea	5 13 10	...	...	...	...	...
4295	Wheel Kitty, t, St. Agnes	5 4 6	...	...	...	...	...
25300	Wh. Newton, c, c, s, i, Calstock	1 0 0	...	...	...	...	...
50	Wheel Owles, t, St. Just	173 15 0	...	...	...	...	...
8000	Wheel Pover, t, Redruth	7 11 0	...	...	...	...	...
4000	Wheel Prussia, t, Redruth	0 6 0	...	...	...	...	...
10000	Wye Valley, i, Montgomery	3 0 0	...	...	...	...	...

FOREIGN DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last wk.
25530	Alamillos, i, Spain	3 0 0	...	...	...	...	...
80000	Almaden and Trito Consol, s, i	1 0 0	...	...	...	...	...
90000	Australian, c, South Australia	7 7 8	...	...	...	...	...
10000	Battle Mountain, s, c, (2500 part pd.)	5 0 0	...	...	...	...	...
15000	Birdseye Creek, c, California	4 0 0	...	...	...	...	...
20000	Capt. Copper Mining, s, i, So. Africa	7 0 0	...	...	...	...	...
34438	Cedar Creek, c, California	30 40 0	...	...	...	...	...
85000	Cesena Sul. Co., Romanga, Italy	10 0 0	...	...	...	...	...
15000	Chicago, s, Utah	40 0 0	...	...	...	...	...
65000	Colorado United, c, Colorado	10 0 0	...	...	...	...	...
10000	Colopio, c, Chile	5 0 0	...	...	...	...	...
100000	Don Pedro North del Rey	16 15 0	...	...	...	...	...
28500	Eberhardt & Aurora, s, Nevada	10 0 0	...	...	...	...	...
70000	English and Australian, c, St. Aust.	2 10 0	...	...	...	...	...
80000	Flagstaff, s, Utah	3 0 0	...	...	...	...	...
25000	Fortuna, s, Utah	10 0 0	...	...	...	...	...
55000	Frontino & Bolivia, s, New Gran.	2 0 0	...	...	...	...	...
30000	Gold Run, s, Utah	2 0 0	...	...	...	...	...
80000	Kapunda Mining Co., Australia	1 0 0	...	...	...	...	...
20000	Last Chance, s, Utah	1 0 0	...	...	...	...	...
15000	Linares, i, Spain	5 0 0	...	...	...	...	...
65000	London and California, s, i	3 0 0	...	...	...	...	...
7887	Lustanlan, Portugal, s, i	2 0 0	...	...	...	...	...
5000	Mamm. Copperopolis of Utah, s, i	3 0 0	...	...	...	...	...
6000	Mountain Chief, s, Utah	10 0 0	...	...	...	...	...
10000	Mountbald, s, i, France	20 0 0	...	...	...	...	...
100000	Port Phillip, c, Clunes	1 0 0	...	...	...	...	...
54000	Richmond Consols, s, Nevada	5 0 0	...	...	...	...	...
40000	Santa Barbara, s, Brazil	11 0 0	...	...	...	...	...
120000	Scottish Australian Mining Co., i	0 10 0	...	...	...	...	...
80000	Sierra Butte, s, California	1 0 0	...	...	...	...	...
122500	Sierra Butte, s, California	1 0 0	...	...	...	...	...
140028	S. B. Plumas, s, Nevada	2 0 0	...	...	...	...	...
40000	South Aurora, s, Nevada	2 0 0	...	...	...	...	...
253000	St. John del Rey	5 0 0	...	...	...	...	...
20008	Tolima, s, s, So. America	255 265	...	...	...	...	...
25000	Victoria (London), s, Australia	1 0 0	...	...	...	...	...
18000	Western Andes, s, New Granada	0 0 0	...	...	...	...	...
21000	W. Prussian (5000 pref. sh. 10f. pd)	10 0 0	...	...	...	...	...

NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last wk.
12000	Argentine, s, Argentine Republic	5 0 0	...	...	...	...	...
3000	Bellavista, s, Peru	10 0 0	...	...	...	...	...
80000	Blue Tent, s, i, California	5 0 0	...	...	...	...	...
10000	Buena Ventura, s, i, California	0 5 0	...	...	...	...	...
10000	Chontales, s, i, Nicaragua	2 0 0	...	...	...	...	...
10000	Coude de Chilli, s, i	1 0 0	...	...	...	...	...
70000	English Australian, s, Victoria	1 0 0	...	...	...	...	...
35 00	Exchequer Hydrolic Gold Washing Co., California	6 0 0	...	...	...	...	...
100000	Exchequer, s, i, California	1 0 0	...	...	...	...	...
40000	Holcombe Valley, s, California	1 0 0	...	...	...	...	...
8000	Hornachos, s, i, Spain	1 0 0	...	...	...	...	...
12000	Huatail, s, i, Orebro, Sweden	10 0 0	...	...	...	...	...
12000	Hunter Consolidated, s, i, Sweden	10 0 0	...	...	...	...	...
20000	Imperial Brazilian Collieries, Brazil	10 0 0	...	...	...	...	...
7500	Isabelle, s, s, California	10 0 0	...	...	...	...	...
100000	J. L. L., s, i, California	5 0 0	...	...	...	...	...
60000	Javali, s, Nicaragua	1 0 0	...	...	...	...	...
3500	La Mancha, i, Newfoundland	2 0 0	...	...	...	...	...
12000	Lanestosa, s, i, Viscaya, Spain	10 0 0	...	...	...	...	...
75000	Malabar, s, Colombia (87155 issued)	1 15 0	...	...	...	...	...
40000	Malpas, s, Colombia (7400 pref. shares, fully paid)	1 0 0	...	...	...	...	...
12000	Menzenberg, c, Konner, Germany	5 0 0	...	...	...	...	...
4588	New Bensberg, i, i, Germany	5 0 0	...	...	...	...	...
60000	New Quebrada, s, Venezuela	5 0 0	...	...	...	...	...
20000	New Zealand Kapanga, s, Coromandel	5 0 0	...	...	...	...	...
3000	Oregon, s, Oregon, U.S. (preference shares)	5 0 0	...	...	...	...	...
80000	Panulillo, c, Chile (250000 debentures)	4 0 0	...	...	...	...	...
50000	Pastorena United, s, Italy	4 0 0	...	...	...	...	...
25000	Pitanguy, s, Brazil (incl. 6000 sh. £1 fully paid)	4 0 0	...	...	...	...	...
25000	Placerville, s, g, California	4 0 0	...	...	...	...	...
50000	Providencia and New Rosario, s, Mexico	2 0 0	...	...	...	...	...
40000	Ravenscliff, s, New Zealand	1 0 0	...	...	...	...	...
50000	Rica, s, Colombia (40000 issued)	0 5 0	...	...	...	...	...
2,141,000	Rio Tinto, s, c, Huelva, Spain	1 0 0	...	...	...	...	...
30000	Rosario Grande, s, Brazil (14 shares)	1 0 0	...	...	...	...	...
10000	Russia Copper, Orenburg and Ufa	1 0 0	...	...	...	...	...
20000	Silver Plume, s, Colorado	1 0 0	...	...	...	...	...
20000	Tecoma, s, Utah	1 0 0	...	...	...	...	...
43174	United Mines, s, Mexico	29 6 3	...	...	...	...	...
14000	Utah, s, i, Utah	10 0 0	...	...	...	...	...
50000	Yorke Peninsula, c, South Australia	2 0 0	...	...	...	...	...
64800	Yorke Peninsula, c, South Australia Preference	1 0 0	...	...	...	...	...

Have made calls since last dividend was paid.

FOREIGN AND MISCELLANEOUS STOCKS.

Shares.	Closing Prices
Argentine, 1868 6 per cent.	67 99
Brazilian, 1868, 6 per cent.	26 27 1/2
Chilian, 1868, 7 per cent.	88 91
City of Providence, 6 p.c. coupon bonds	99 101 1/2
Do, unified debt, scrip	70 70 1/2
Do, 7 per cent. Y.M.L.	78 81
Do, 6 per cent. Y.M.L.	82 84
Do, K. Daira Sanieh	59 60

FOREIGN AND MISCELLANEOUS BONDS, LOANS, AND TRUSTS.

Shares.	Closing Prices
Foreign and Col. Gov. Trust, 6 p.c.	66 71
Do, 6 per cent., 2d issue	58 63
Do, 1872, 4th issue	53 58
Do, 1872, 5th issue	55 60
Peruvian, 1870, 6 per cent.	52 57
Russian, 1872, 5 per cent.	12 1/2
Spanish, Quiksilver Mort., 5 p.c.	95 97
United States Mort. 6 per cent.	99 101

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos.
40000	Aberdarn, s, i, Llanidloes	1 0 0	3 1/2	3 3/4
2500	Aberllyn, s, i, Carnarvon	10 0 0	12	10 1/2
10000	Aberystwyth, s, i, Cardigan	5 0 0
50	Albion, s, i, Cornwall
12000	Ashton, s, i, Carnarvonshire	100 0 0
15000	Ballycumshack, s, c, Schull	5 0 0	3 1/2	3 3/4
12000	Bedford Unit, s, c, Tavis. (11. lib.)	3 0 0	3 1/2	3 3/4
30000	Beitvean, t, c, Gwynnapp	0 1 0
8000	Blanc Gellan, s, i, Cardigan	2 0 0	3 1/2	3 3/4
3937	Blue Hills, t, c, St. Agnes	3 0 0	3 1/2	3 3/4
30000	Bodfryn, s, i, Denbighshire	3 16 6	3 1/2	3 3/4
1000	Bollhope Vale, s, i, Durham	1 0 0	1 3/4	1 1/2
200	Botallack, t, c, St. Just	5 0 0
3000	Bowden Hill, s, i, Wrexham	123 15 0
4000	Bradwell Moss Rake	1 0 0
10 00	British, s, i, Wrexham	1 0 0	1	1
256	Brownelly, s, c, St. Neot	...	3	2 1/2
50000	Cambrian, s, i, c, Cardiganshire	0 10 0	2	1 3/4
20000	Central Fardale, i, i, of Man (24 sh.)	2 0 0	2 1/2	2 3/4
10000	Central Van, s, i, Llanidloes	1 0 0
7500	Combella, s, i, Llanwrst	5 0 0
4000	Combmartin, s, i, Wendron	2 0 0	1 3/4	1 3/4
15000	Court Grange, s, i, North Devon	0 7 0
5000	Cwm Brynno, s, i, Cardigan	1 0 0	3 1/2	...
5000	Cwm Dywfor, s, i, Wales	2 0 0	2 1/2	2 3/4
3000	Ditto, 12 1/2 per cent. pref.	1 0 0
1 60	Dwynwathwy (New), Cardiganshire	1 0 0
1024	D'Eresby Cons., i, t, Carnarvon	5 0 0
10000	D'Eresby Mountain, i, t, Llanwrst	10 0 0	8	6 8
20000	Denbighshire Consolidated, s, i	20 0 0	40	30 40
10000	Dubby, s, i, Durham	3 0 0	1 1/2	1 1/2
10000	Dubby Syke, i, Durham	4 0 0	1 1/2	1 1/2
6144	East Caradon, c, St. Cleer	0 15 0	2s.	2s.
4000	East Chiverton, i, Perranabuloe	2 19 0	3 1/2	3 1/2
3000	East Craven Moor, s, i, Pateley Edge	7 7 6	1 1/2	1 1/2
8000	East Goginan, i, Cardigan	10 0 0	10	9 10
18000	East Roman Gravel, s, i, Salop	2 0 0
1728	East Van, i, Llanidloes	1 0 0	3 1/2	3 1/2
3000	Elgar, s, i, Cardiganshire	6 0 0	1 1/2	1 1/2
60	Frongoch, i, Cardigan (1800 issued)	1 0 0	3 1/2	3 1/2
300	Frusterley, s, i, Durham	2 0 0	3	2 3/4
600	Gawton, c, Tavislock	1 0 0	1 1/2	1 1/2
400	Glan Clwyd, s, i, Gwyddelwern	4 5 6	3 1/2	3 1/2
600	Glynro, s, i, Isle of Man	1 0 0	3 1/2	3 1/2
600	Glynro, s, i, Llanidloes	4 5 0	3 1/2	3 1/2
600	Goginan, s, i, Llanidloes	2 10 0	3 1/2	3 1/2
600	Goreu, s, i, Llanidloes	2 10 0	3 1/2	3 1/2
600	Gt. E. Foxdale, s, i, Carnarvon	1 0 0
600	Gt. Holway, s, i, L. of Man (11. sh)	0 15 0	1	3 1
600	Gt. Pateley, s, i, Flintshire	5 0 0
600	Gt. Pateley, s, i, Flintshire	5 0 0
600	Gt. Wheel Eleanor, s, i, Holywell	2 0 0	4 1/2	5
600	Gt. Wheel Eleanor, s, i, Holywell	2 0 0
600	Gt. Wheel Eleanor, s, i, Holywell	2 0 0
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